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# JOURNAL

OF THE

# ASIATIC SOCIETY OF BENGAL.

## VOL. LXI.

PART II. (NATURAL HISTORY, &c.)

(Nos. I TO III.—1892.)

EDITED BY

SURGEON-CAPTAIN J. H. TULL WALSH, J. M. S.

NATURAL HISTORY SECRETARY.

It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease." SIR WM. JONES.

CALCUTTA:

PRINTED AT THE BAPTIST MISSION PRESS,

AND PUBLISHED BY THE

ASIATIC SOCIETY, 57 PARK STREET.

1893.

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## LIST OF CONTRIBUTORS.


| | Page. |
|---|---|
| BIGOT, J. M. F. ;—*Catalogue of the* Diptera *of the Oriental Region, Part II,* ..... | 133 |
| ,, *III,* ..... | 178 |
| BRÜHL, P. ;—*De Ranunculaceis Indicis Disputationes.* (Tab. III—VI.) ..... | 270 |
| KING, GEORGE, M. B., LL. D., F. R. S., C. I. E. ;—*Materials for a Flora of the Malayan Peninsula, No. IV,* ..... | 1 |
| NICE'VILLE, LIONEL DE ;—*Note on the Indian Butterflies comprised in the subgenus* Pademma *of the genus* Euplœa, ..... | 237 |
| PEAL, S. E. ;—*The Communal Barracks of Primitive Races* (*Plates I and II*), ..... | 246 |
| PRAIN, D. ;—Noviciæ Indicæ V. *An undescribed* Mezoneuron *from the Andaman Group,* ..... | 130 |


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*Dates of Issue. Part II*, 1892.

No. I.—Containing pp. 1—132, was issued on June 13th, 1892.
No. II.—Containing pp. 133—236, was issued on July 23rd, 1892.
No. III.—Containing pp. 237—324, with Plates I, II, III, IV, V and VI, was issued on January 24th, 1893.

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## LIST OF PLATES.

I, II } Communal Barracks of Primitive Races (Peal).

III, IV, V, VI } Aquilegia (Brühl).

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# JOURNAL

OF THE

# ASIATIC SOCIETY OF BENGAL.

## Part II.—NATURAL SCIENCE.

## No. 1.—1892.


I.—*Materials for a Flora of the Malay Peninsula.*—*By* GEORGE KING, M. B., LL. D., F. R. S., C. I. E., *Superintendent of the Royal Botanic Garden, Calcutta.*

No. 4.

As explained in No. 1 of these papers, I was unable to take up the Natural Family of Anonaceæ in its natural sequence. Having now been able to work it out, I present my account of it to the Society. Another of the *Thalamifloral* families (*Dipterocarpeæ*) still remains to be worked out before beginning the *Disciflorœ*. In the present paper I have followed, for the most part, the arrangement of tribes and the limitations of genera adopted by Sir J. D. Hooker in his Flora of British India; and in most of the instances where I have not done so the fact has been noted.

### ORDER IV. ANONACEÆ.

Trees or shrubs, often climbing and aromatic. *Leaves* alternate, exstipulate, simple, quite entire. *Flowers* 2- rarely 1-sexual. *Sepals* 3, free or connate, usually valvate, rarely imbricate. *Petals* 6, hypogynous, 2-seriate, or the inner absent. (*Flowers* dimerous in *Disepalum*). *Stamens* many, rarely definite, hypogynous, closely packed on the torus, filaments short or 0; anthers adnate cells extrorse or sublateral, connective produced into an oblong dilated or truncate head. *Ovaries* 1 or more, apo-



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carpous, very rarely (*Anona*) syncarpous with distinct or agglutinated stigmas, style short or 0; ovules 1 or more. *Fruit* of 1 or more, sessile or stalked, 1- or many-seeded, usually indehiscent carpels. *Seeds* large; testa crustaceous or coriaceous; albumen dense, ruminate, often divided almost to the axis into several series of horizontal plates; embryo small or minute, cotyledons divaricating.—Distrib. Tropics of the Old World chiefly; genera about 45 with 500 or 600 species.

Tribe I. UVARIÆ. *Petals* 2-seriate, one or both series imbricate in bud. *Stamens* many, close-packed; their anther-cells concealed by the overlapping connectives. *Ovaries* indefinite.

*Sepals* imbricate; trees or shrubs.

Flowers small, globular, scarcely opening; often uni-sexual and from the older branches or trunk; ovules 6 to 8, or indefinite.

Trees; flowers 1-sexual; ovules many; torus conical or hemispheric ... ... ... 1. *Stelechocarpus.*

Trees or shrubs; flowers unisexual or hermaphrodite; ovules 6 to 8; torus flat ... ... 2. *Sageraea.*

*Sepals* valvate; climbers.

Flowers small, mostly hermaphrodite; petals incurved, ovules 6 to 8; torus flat ... ... ... 3. *Cyathostemma.*

Flowers usually large and from the leafy branches, petals spreading; torus flat.

Flowers 2-sexual; ovules many ... 4. *Uvaria.*

Flowers 1- or 2-sexual; ovules solitary, rarely 2 ... ... 5. *Ellipeia.*

Tribe II. UNONEÆ. *Petals* valvate or open in bud, spreading in flower, flat, or concave at the base only; inner subsimilar or 0. *Stamens* many, close-packed; their anther-cells concealed by the overlapping connectives. *Ovaries* indefinite.

Flowers trimerous.

*Petals* conniving at the concave base and covering the stamens and ovaries.

Ovaries 1–3, many-ovuled; peduncles not hooked ... ... 6. *Cyathocalyx.*

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Ovaries many, 2-ovuled : peduncles hooked ... ... ... 7. *Artabotrys.*
Ovaries many ; ovules 4 or more ; peduncles straight ... ... 8. *Drepananthus.*
*Petals* flat, spreading from the base.
Ripe carpels indehiscent.
Ovules many, 2-seriate ; petals lanceolate, stamens with acute apical appendage ... 9. *Canangium.*
Ovules 2–6, 1-seriate on the ventral suture ... ... 10. *Unona.*
Ovules 1–2, basal or subbasal... 11. *Polyalthia.*
Ripe carpels follicular ... 12. *Anaxagorea.*
Flowers dimerous ... ... ... 13. *Disepalum.*

Tribe III. MITREPHOREÆ. *Petals* valvate in bud, outer spreading ; inner dissimilar, concave, connivent, arching over the stamens and pistils, (divergent in some *Mitrephoras*). *Stamens* many, (few in *Orophea*), closely packed ; anther-cells (except in *Orophea*) concealed by the overlapping connectives. *Pistils* numerous (few in some *Oropheas*).
Inner petals clawed.
Inner petals connivent in a cone, but not vaulted ... ... 14. *Goniothalamus.*
Inner petals vaulted,
Stamens about 6, Miliusoid ; inner petals longer than the outer ... 15. *Orophea.*
Stamens numerous, Uvarioid ; inner petals not longer or very little longer than the outer ... 16. *Mitrephora.*
Inner petals not clawed.
Flowers globose ; petals subequal ... 17. *Popowia.*
Flowers elongate ; inner petals much shorter than the outer ... ... 18. *Oxymitra.*

Tribe IV. XYLOPIEÆ. *Petals* valvate in bud, thick and rigid, connivent ; the inner similar but smaller, rarely 0.
Outer petals broad ; torus convex ... 19. *Melodorum.*
Outer petals narrow, often triquetrous ; torus flat or concave ... ... 20. *Xylopia.*

Tribe V. MILIUSEÆ. *Petals* valvate in bud, the

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outer sometimes very small like the sepals. *Stamens* often definite, loosely imbricate; anther-cells (except in *Phœanthus*) not concealed by the connectives. *Ovaries* solitary or indefinite.

*Ovaries* indefinite.

Sepals and outer petals similar and minute; inner petals very large, often cohering by their edges.

Ovules 1 or 2: stamens numerous, quadrate, with broad truncate apical processes concealing the anther-cells from above ... 21. *Phœanthus.*

Ovules 1 or 2, rarely 3 or 4; stamens few or numerous, compressed, the apical process of the connective compressed, not broad or truncate, and not concealing the anther-cells from above ... ... 22. *Miliusa.*

Petals larger than the sepals, often saccate at the base, subequal or the inner smaller 23. *Alphonsea.*

*Ovaries* solitary.

Outer petals valvate, inner imbricate ... 24. *Kingstonia.*

All the petals valvate ... ... 25. *Mezzettia.*

### 1. Stelechocarpus, Blume.

Trees. *Leaves* coriaceous. *Flowers* dicœcious, fascicled, on the old wood. *Sepals* 3, small, elliptic or orbicular, imbricate. *Torus* conical. *Stamens* indefinite; connective dilated, truncate. *Ovaries* indefinite, ovoid; stigma sessile; ovules 6 or more. *Ripe carpels* large, berried, globose, 4–6-seeded.—Distrib. Species 3 or 4, all Malayan.

Leaves pellucid-punctate ... ... ... 1 *S. punctatus.*

Leaves not pellucid-punctate.

Flowers of both sexes alike ... ... 2 *S. nitidus.*

Male flowers smaller than the female ... 3 *S. Burahol.*

1. Stelechocarpus punctatus, King n. sp. A tree 20 to 30 feet high: young branches slender, cinereous-puberulous, becoming glabrous. *Leaves* membranous, minutely pellucid-punctate, elliptic-ovate, shortly acuminate, slightly narrowed in the lower fourth to the rounded suboblique base: upper surface shining, glabrous except the pubescent impressed midrib; lower surface shining, paler than the upper, sparsely puberulous or glabrous, the reticulations minute and distinct: main nerves 12 to 14 pairs, bold and prominent on the lower, slightly impres-

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sed on the upper, surface: length of blade 7 to 10 in., breadth 3 to 4 in.; petiole ·15 to ·2 in., stout, pubescent. *Male flowers* in several-flowered fascicles from woody tubercles on the trunk, pedunculate: buds turbinate, nearly ·5 in., in diam.; peduncles 1 to 1·5 in. long, stout, thickened upwards, ebracteolate, puberulous. *Sepals* very coriaceous, rotund, concave, conjoined at the base, spreading, rugose, pubescent outside, glabrous inside. *Petals* very coriaceous, rotund, concave, glabrous; the outer 3 puberulous outside; the inner three smaller than the outer, quite glabrous, otherwise like them and all of a dark brownish colour. *Anthers* sessile, flat, the cells elongate on the anterior surface, the back striate: apex without any appendage from the connective. *Female flowers* and *fruit* unknown.

Perak; King's Collector, No. 7183.

Although female flowers and fruit of this have not yet been found, I describe it as a new species of *Stelechocarpus* without any hesitation. Its male flowers have exactly the facies of those of *S. Burahol*, Bl.; but they are larger. They, however, differ as to shape of petals; the leaves of this species are distinctly pellucid-punctate (while those of *S. Burahol* are not) and they are broader and have slightly more nerves than those of *S. Burahol*. When boiled, the flowers of the two have exactly the same peculiar sweetish smell.

2. Stelechocarpus nitidus, King, n. sp. A tree 30 to 60 feet high; all parts glabrous except the inflorescence: young branches darkly cinereous, slender. *Leaves* coriaceous, oblong-lanceolate, shortly acuminate, the base acute; both surfaces shining, very minutely scaly, the midrib and nerves deeply impressed on the upper, bold and prominent on the lower; the reticulations distinct on both: main nerves 10 to 12 pairs, curved, sub-ascending, inter-arching within the edge: length of blade 6 to 9 in., breadth 1·8 to 3·25 in., petiole ·35 in. *Male flowers* in many-flowered fascicles from tubercles on the trunk, pedicellate; buds turbinate; flowers when open probably nearly 1 in. in diam.: pedicels stout, thickened upwards, 1 to 1·5 in. long, scurfy-puberulous, each with several sub-rotund glabrous bracteoles mostly near its base. *Sepals* very coriaceous, shortly oblong, obtuse, concave, spreading, conjoined at the base, puberulous or glabrescent, warted externally. Outer 3 petals much larger than the sepals and somewhat larger than the inner 3 petals, rotund, concave, very coriaceous, glabrous, with scurfy warts externally near the middle: inner 3 petals coriaceous, rotund, blunt, cucullate, glabrous. *Female flowers* like the males, stamens none: *Ovaries* very numerous, obscurely 3-angled, adpressed-sericeous. *Torus* hemispheric. *Ripe carpels* broadly ovoid, blunt, 2·5 in. long, 1·75 in. in diam., puberulous, minutely warted; pericarp thick, fleshy. *Seeds* about 8 in 2 rows, flattened, 1·25 in. long, and ·5 in. thick.

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Perak; in dense forest at low elevations, King's Collector, Nos. 7629 and 8224.

This species has the flowers of both sexes alike. The carpels of this species are much larger than those of *S. Burahol*, Bl.; and its leaves are more thickly coriaceous and shining, the nerves and midrib being much more depressed on the upper and prominent on the lower surface.

3. Stelechocarpus Burahol, H. f. and T. Fl. Ind. 94. A tree 20 to 60 feet high: young branches slender, dark-coloured, glabrous. *Leaves* thinly coriaceous, oblong-lanceolate, acute or very shortly acuminate, the base cuneate: both surfaces glabrous, shining, the reticulations minute and distinct, the lower with minute black dots, the upper with very minute scales; main nerves 10 to 12 pairs, subascending, prominent, inter-arching ·2 in. within the margin; length of blade 5 to 8 in.; breadth 1·75 to 2·75 in.; petiole ·3 to ·9 in. *Male flowers* much smaller than the female (only about ·4 in. in diam.), in fascicles of 8 to 16 from minutely bracteolate woody tubercles from the branches and trunk, pedicellate; the pedicels slender, ebracteolate, tomentose, from ·5 to ·75 in. long. *Sepals* coriaceous, triangular, spreading. *Petals* much longer than the sepals, oblong, sub-acute, warted, pubescent inside: anthers with obtuse terminal, dilated, 2-lobed apical appendages from the connective; ovaries 0. *Female flowers* three times as large as the males, and on similar pedicels; calyx not persistent; corolla as in the male. *Ovaries* numerous, on an ovoid-conic torus, oval or obovate, the outer surface compressed, the inner with a vertical ridge and adpressed, pale hairs; stigma sessile, minutely lobed. *Fruit* on stout peduncles 2 to 3 in. long, thickened upwards. *Ripe carpels* few, shortly stalked, globose, obovate, about 1·5 in. long, and 1·25 in. in diam.; when young puberulous, verrucose, afterwards nearly smooth; pericarp pulpy, coriaceous externally. *Seeds* 4 to 6, large, oval, sub-compressed, subrugose. Hook. fil. Fl. Br. Ind. I, 47. *Uvaria Burahol*, Blume Bijdr. 14; Floræ Javæ Anon. 48, t. 23, and 25 C.; Scheff. in Nat. Tijdsch. Ned. Ind. XXXI, 5.

Singapore; Lobb. Distrib. Java.

There is sometimes a remarkable difference in the length of the petioles in this species, some of those *on the same specimen* being three times as long as others.

2. Sageræa, Dalz.

Trees. *Leaves* shining, and branches glabrous. *Flowers* small, axillary or fascicled on woody tubercles, 1–2-sexual. *Sepals* orbicular or ovate, imbricate. *Petals* 6, imbricate in 2 series, nearly equal, usually orbicular, very concave. *Stamens* 6–21, imbricate in 2 or more series,

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broadly oblong, thick, fleshy; anther-cells dorsal, oblong; connective produced. *Ovaries* 3–6; style short, stigma obtuse or capitate; ovules 6 to 8, on the ventral suture. *Ripe carpels* globose or ovoid, stalked.—DISTRIB. Species 6, tropical Asiatic.

A genus closely allied to *Bocagea*, St. Hilaire, but differing from that in having its sepals and petals much imbricate instead of valvate; in bearing more ovules, and more seeds in its ripe carpels; in its anther-cells being more lateral and not so entirely dorsal as in *Bocagea*, and in the apical process of the connective being truncate. The flowers of *Sageraea* are small and the sepals and petals are very concave; and in these respects, as well in the comparative fewness of the seeds in their ripe carpels, they diverge from those of typical *Uvariæ*. Hooker filius and Thomson (in their Flora Indica), Bentham and Hooker (in their Genera Plantarum), and Baillon (in his Histoire des Plantes, Vol. I, 202, 281) retain *Sageraea* as a genus,—an example which I would have followed without any hesitation had not Sir Joseph Hooker united it with *Bocagea* in his Flora of British India. The extreme imbrication both of the sepals and petals appears to me however, in spite of Sir Joseph Hooker's more recent view, so insurmountable an argument against its reduction to a genus in which both these sets of organs are very distinctly valvate, that I adhere to the earlier view that *Sageraea* should remain distinct and be put in the tribe *Uvariæ*.

1. SAGERAEA ELLIPTICA, Hook. fil. and Thoms. Fl. Ind. 93. A large tree; all parts glabrous except the ciliate petals; young branches rather stout, angled. *Leaves* coriaceous, narrowly oblong, acute (obtuse, when very old); the base narrowed, obtuse or minutely cordate, oblique: both surfaces shining; main nerves 14 to 16 pairs, spreading, faint; length 8 to 12 in., breadth 2·25 to 3·5 in.; petiole ·15 in, very thick. *Flowers* monoecious, solitary and axillary, or fascicled on tubercles on the larger branches, small, red: pedicels ·25 in. long, with several basal and medial bracts. *Sepals* small, semi-orbicular, glabrous, ciliate. *Petals* thick, ovate-orbicular, concave, tubercular outside, glabrous, the edges ciliate, ·25 in. long; the inner smaller than the outer. *Stamens* 12 to 18, the connective sub-quadrate at the apex; anthers extrorse. *Ovaries* in female flower about 3, glabrous; ovules about 8. *Ripe carpels* sub-sessile, globose, glabrous, 1 in. in diam., seeds several. *Sageraea Hookeri*, Pierre Flore Forest. Coch-Chine t. 15. *Bocagea elliptica*, H. f. and Th. Fl. Br. Ind. I, 92; Kurz F. Flora Burma, I, 50. *Uvaria elliptica*, *A. DC.* in Mem. Soc. Genev. v. 27; Wall. Cat. 6470, 7421. *Diospyros? frondosa*, Wall. Cat. 4125.

Burmah to Penang.

An imperfectly known species, badly represented in collections.

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### 3. Cyathostemma, Griffith.

Scandent shrubs. *Flowers* subglobose in di- or tri-chotomous pendulous cymes from the old wood (flowers dimorphous in sp. 3.) *Sepals* 3, connate, hirsute. *Petals* 6, 2-seriate, short, sub-equal, their bases fleshy, all valvate at the base, the tips imbricate. *Torus* flat, margin convex. *Stamens* many, linear; anthers sub-introrse; process of connective oblique, incurved. *Ovaries* many; style cylindric, glabrous, notched; ovules many. *Ripe carpels* oblong-ovoid, many-seeded.

The petals in this genus are so unmistakeably imbricate in æstivation, that I remove it from the tribe *Unoneæ* to *Uvariæ*. The ripe carpels moreover much resemble those of some species of *Uvaria*. Of the five species described below, three are quite new. The first (*C. viridiflorum*) is the plant upon which Griffith founded the genus; while the fourth has been hitherto referred to *Uvaria* under the specific name *U. parviflora*.

Flowers uniform and hermaphrodite.

| | |
|---|---|
| Flowers in more or less elongated pendent cymes | |
| Leaves oblong-lanceolate or oblanceolate; inner petals contracted at the base ... | 1. *C. viridiflorum.* |
| Leaves obovate-elliptic to obovate-oblong; petals not contracted at the base ... | 2. *C. Scortechinii.* |
| Flowers in stem-fascicles of 10 to 14, or in axillary pairs; leaves with pubescent midribs ... ... ... | 3. *C. Wrayi.* |
| Flowers in 2- or 3-flowered extra-axillary or leaf-opposed fascicles or cymes: leaves quite glabrous ... ... | 4. *C. Hookeri.* |
| Flowers dimorphous, the females with a few abortive anthers ... ... ... | 5. *C. acuminatum.* |

1. Cyathostemma viridiflorum, Griff. Notulæ IV, 707: Ic. Pl. IV, t. 650. Scandent (?) the young branches thin, glabrous, dark-coloured when dry. *Leaves* coriaceous, oblong-lanceolate or oblanceolate, apiculate; the base slightly narrowed, minutely cordate: both surfaces rather dull; the upper glabrous except the minutely tomentose midrib; the lower darker, puberulous on the midrib and 8 to 10 pairs of rather prominent spreading main nerves; length 4·5 to 7·5 in., breadth 1·5 to 2 in., petiole ·2 in. *Cymes* dichotomous, on peduncles several inches long from warty tubercles on the older roughly striate branches, few-flowered, corymbose, minutely rusty-tomentose, with an oblong bract at each bifurcation and another about the middle of each pedicel. *Flowers* ·5 in. in diam. *Sepals* broadly cordate, spreading or sub-reflexed. *Petals* acute, the base contracted especially in those of

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the inner row, coriaceous, tomentose. *Ovaries* tomentose. *Ripe carpels* stalked, 1 to 1·5 in. long, oblong-ovoid, blunt, glabrous; stalk ·75 in. Hook. fil. Fl. Br. Ind. I, 57; Kurz For. Fl. Burm. I, 33.

Eastern Peninsula; Griffith. Penang; Maingay (Kew Distrib.) No 36.

A species known by only a few imperfect specimens. According to Griffith, the wood of this species resembles that of a Menisperm. Kurz gives this as a native of the Andamans; but I have seen no specimen from those islands.

2. Cyathostemma Scortechinii, n. sp. King. A climber 50 to 70 feet long: branches of all ages, except the very youngest, dark-coloured, glabrous; the very youngest slender and rufous-pubescent. *Leaves* coriaceous, obovate-elliptic to obovate-oblong, shortly apiculate, slightly narrowed to the sub-cuneate, not cordate, base; upper surface rather dull, glabrous except the minutely pubescent midrib; lower glabrous, the midrib slightly muriculate, the reticulations fine, distinct: main nerves 8 to 11 pairs, prominent beneath: length 6 to 10 in., breadth 2·5 to 4 in., petiole ·25 in. *Cymes* di- or tri-chotomous, on pedicels 2 to 12 in. long from the older branches; minutely rufous-tomentose, bracteate in the upper half; the bracts numerous, ovate to rotund, concave. *Flowers* ·5 in. in diam. *Sepals* sub-rotund, united into an obscurely 3-angled flattish cup. *Petals* equal, not much longer than the stamens, sub-rotund, puberulous, coriaceous. *Connective of stamens* produced at the apex, obliquely truncate. *Ovaries* numerous, cylindric, pubescent: stigmas truncate: ovules numerous. *Ripe carpels* oblong, slightly oblique, apiculate, transversly furrowed, glabrous, shortly stalked, 1·25 to 1·5 in. long; pericarp thin. *Seeds* 8 to 10, flattened, ovoid, smooth.

Perak; Scortechini, King's Collector, No. 5857. Singapore: Ridley.

The specimens collected by the late Father Scortechini were referred by him to *Cyathostemma viridiflorum*, Griff., from which species however, this differs by its larger, more obovate, more glabrous, leaves; flat calyx-cup formed by the entirely connate sepals; more rotund petals, not contracted at the base; and narrower shorter-stalked fruit.

3. Cyathostemma Wrayi, King n. sp. A creeper 20 to 60 feet long: young branches rufous-puberulous, ultimately glabrous and darkly cinerous. *Leaves* membranous, broadly oblanceolate, shortly and rather obtusely acuminate, narrowed below the middle to the rounded base; both surfaces finely reticulate, the upper dull when dry, glabrous; the midrib minutely pubescent; lower surface shining, glabrous except the sparsely puberulous midrib; main nerves 8 to 9 pairs, obliqve, forming double arches inside the margin, impressed on the upper, pro-



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minent on the lower surface; length 7 to 9 in., breadth 2·5 to 3 in., petiole ·2 in. *Flowers* in fascicles of 10 to 14 from tubercles on the older branches, or in pairs from the axils of the leaves, sub-globular, about ·5 in. in diam.; pedicels ·25 to ·4 in. long, granular, sparsely pubescent and with a small ovate bracteole near the base. *Sepals* broadly ovate, spreading, rufous-puberulous and granular outside, glabrous inside, ·1 in. long. *Petals* concave, cartilaginous, slightly imbricate, minutely puberulous especially towards the edges; the outer row ovate-orbicular, sub-acute, ·35 in. long; the inner row smaller, thicker, blunter and more imbricate than the outer. *Stamens* numerous; the connective with a rather thick truncate, 4- or 5-sided apical process concealing the apices of the linear dorsal anthers. *Ovaries* numerous, obliquely oblong, curved, glabrous, pubescent at the base, 1 to 2-ovuled, with a conical, narrow, inflexed stigma. *Ripe carpels* reddish, ovoid, ·4 to ·6 in. long, glabrous, with a single ovoid or 2 plano-convex shining pale brown seeds: stalks about as long as the carpels, slender.

Perak; Scortechini, Wray, King's Collector.

4. CYATHOSTEMMA HOOKERI, King n. sp. A climber 40 to 80 feet long; all parts, except the inflorescence, quite glabrous. *Leaves* membranous, broadly oblanceolate to oblong or ovate-elliptic, acute or very shortly and obtusely acuminate, the base rounded or sub-cuneate; both surfaces shining, glabrous, minutely reticulate; main nerves 9 or 10 pairs, spreading or ascending, curving, inter-arching within the edge; length 5·5 to 7 in., breadth 2·25 to 2·75 in., petiole ·3 in. *Flowers* ·25 in. in diam., sub-globose, in extra-axillary or leaf-opposed fascicles or cymes of 2 or 3; pedicels slender, puberulous, ·3 to ·4 in long with 1 or 2 bracteoles. *Sepals* spreading, broadly and obliquely ovate, sub-acute, slightly thickened at the base, ·1 in. long. *Petals* concave; the outer row slightly longer than the sepals but narrower, obovate, contracted into a pseudo-claw at the base, sparsely puberulous outside; the inner row narrower, thicker, and more concave, oblique. *Stamens* numerous, short, with a thick incurved apical process from the connective; anther cells dorsal. *Ovaries* numerous, oblong, thickened upwards, puberulous; the stigma large, sub-quadrate, slightly 2-lobed. *Ripe carpels* numerous, oblong to ovoid, blunt at each end, glabrescent, ·75 to 1·75 in. long and ·6 to ·9 in. in diam.; stalk 1·5 to 2 in. stout. *Seeds* 6 in a single row, compressed, oblong, pale brown, shining. *Uvaria parviflora*, Hook. fil. and Thoms. Fl. Ind. 103; Fl. Br. Ind. I, 51.

Penang; Phillips, Curtis. Perak; Scortechini, Wray, King's Collector.

For upwards of seventy years this plant had been known only by Phillips' scanty specimens from Penang. In 1887 Mr. Curtis sent

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flowering specimens of it, together with a single ripe carpel from the same island; while copious flowering and fruiting specimens were, about the same time, received from Perak. In all its parts the plant is essentially a *Cyathostemma*.

5. Cyathostemma acuminatum, n. sp. King. A climber; branches pale brownish, the youngest slender, dark-coloured, rufous-puberulous. *Leaves* membranous, oblanceolate-oblong, caudate-acuminate, the base acute; both surfaces glabrous shining and minutely reticulate; the midrib depressed above and puberulous, beneath prominent and minutely muriculate: main nerves 10 to 11 pairs, spreading, curved, sub-ascending, prominent beneath, depressed above: length 8 to 9 in.; breadth 2·2 to 2·5 in.; petiole ·15 in., tomentose. *Cymes of hermaphrodite flowers* rufous-pubescent, 4 to 6 in. long; pedicel about as long as the branches, the latter with numerous distichous, oblong, nervose bracts. *Flowers* 4 to 5 in. in diam., on short pedicels. *Sepals* triangular, blunt, spreading. *Petals* as in *C. Scortechinii*; connective of stamens forming at the apex a thick incurving point. *Ovaries* as in *C. Scortechinii* but with conical stigma. *Cymes of female flowers* much shorter than those of the hermaphrodite, dichotomous, few-flowered, about 1·5 in. long (of which the peduncle is 1 in.); slightly rufous-pubescent; bracts few, lanceolate. *Flowers* about ·4 in. in diam. when open, buds conical. *Sepals* broadly triangular, cordate, acute, spreading, pubescent. *Petals* coriaceous, granular-pubescent, concave; the outer broadly ovate-triangular, the apex sub-acute, incurved in bud; the inner row smaller, narrower, erect, connivent. *Stamens* absent. *Ovaries* as in the hermaphrodite, but the stigma larger, and not conical.

Upper Perak; Wray No. 3468.

A remarkable species of which I have seen only Wray's incomplete specimens. These specimens are accompanied by some loose young carpels, ovate-globular, oblique, with persistent recurved styles, and a single or at most two seeds. If these carpels really belong to the specimen, the definition of the genus will have to be modified. The structure of both the hermaphrodite and pistillate flowers agrees perfectly with that of the other species above described.

### 4. Uvaria, Linn.

Scandent or sarmentose shrubs, usually stellately pubescent. *Flowers* terminal or leaf-opposed, rarely axillary, cymose, fascicled or solitary, yellow, purple or brown. *Sepals* 3, often connate below, valvate. *Petals* 6, orbicular, oval or oblong, imbricate in 2 rows, sometimes connate at the base. *Stamens* indefinite; top of connective ovoid-oblong, truncate or subfoliaceous. *Torus* depressed, pubescent or tomentose. *Ovaries* in-

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definite, linear-oblong; style short, thick; ovules many, 2-seriate, rarely few or 1-seriate. *Ripe carpels* many, dry or berried, few- or many-seeded.—DISTRIB. About 110 species—many tropical Asiatic, a few African species, and some Australian.

A genus characterised by the usually large showy flowers with imbricate Rosaceous corolla:—allied to the American genus *Guatteria* Ruiz and Pavon (*Cananga*, Aubl.) and distinguished from it chiefly by its multi-ovulate ovaries.

Flowers more than ·5 in. in diam.

Connective of anthers slightly produced at the apex, compressed, oblique.

Carpels stalked, oblong, rugulose ... 1. *U. Larep.*

Carpels ovoid to sub-globular.

Carpels 1·5 to 2·25 in. long, not tuberculate, very pulpy, tomentose ... 2. *U. Hamiltoni.*

Carpels not more than 1 in. long, tubercular, with little pulp.

Carpels ovoid, oblique; leaves woolly-tomentose beneath, even when old 3. *U. dulcis.*

Carpels globular or globular-ovoid, leaves glabrous when adult ... 4. *U. Lobbiana.*

Connective produced beyond the apex to about half the length of the anther, flattened, obliquely truncate; flower 1·5 in. in diam. ... 5. *U. macrophylla.*

Connectives produced, those of the inner anthers truncate, those of the outer flattened and oblique: flower 2 to 3 in. in diam.; leaves conspicuously stellate-tomentose beneath ... ... ... ... 6. *U. purpurea.*

Connectives of anthers slightly, or not at all, produced at the truncate apex.

Whole plant stiffly hairy... ... 7. *U. hirsuta.*

Whole plant softly hairy... ... 8. *U. Curtisii.*

Connectives of anthers produced into a broad flattened sub-quadrate process; the outer anthers changed into staminodes ... 9. *U. Ridleyi.*

Anthers oblong-cuneate, the connectives produced at the apex and always truncate.

Leaves pubescent beneath.

Flowers in terminal umbellate racemes ... ... ... 10. *U. pauci-ovulata.*

Flowers in terminal umbels or in

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| | | |
|---|---|---|
| many-flowered lateral narrow panicles ... ... ... | 11. | *U. Scortechinii.* |
| Leaves glabrous except the midrib, 2·5 to 5 in. long; flowers less than ·5 in. in diam. ... ... ... | 12. | *U. micrantha.* |
| Flowers small (less than ·5 in. in diam.) | | |
| Leaves glabrous except the midrib ... | 12. | *U. micrantha.* |
| Leaves pubescent. | | |
| Leaves on under-surface stellate rufous-pubescent; young branches and flowers outside with scurfy rufous tomentum ... ... ... | 13. | *U. andamanica.* |
| Leaves on under surface and young branches minutely tawny-tomentose .. | 14. | *U. excelsa.* |
| Species of doubtful position. | | |
| Probably near *U. Lobbiana* ... ... | 15. | *U. astrosticta.* |
| With axillary flowers ... ... | 16. | *U. sub-repanda.* |

1. Uvaria Larep, Miq. Fl. Ind. Bat. Suppl. 370. A climber 20 to 40 feet long: youngest branches and petioles sparsely covered with minute scaly stellate hairs; the older cinereous, lenticellate, glabrescent. *Leaves* membranous, elliptic or sub-obovate-elliptic, shortly acuminate, slightly narrowed in the lower fourth to the rounded sub-emarginate, not cordate, base: upper surface glabrous, shining, the midrib minutely tomentose; lower surface with a few short spreading hairs on the midrib and some of the nerves, otherwise almost glabrous; main nerves 10 to 12 pairs, spreading, interarching within the edge, bold in the lower, impressed on the upper, surface; length of blade 5 to 8 in., breadth 2 to 3 in., petiole ·2 to ·3 in. *Peduncles* from half-way between the leaves, ·1 in. long, 1- to 2-flowered (one of the flowers often abortive), warted and yellowish-pubescent; pedicels ·75 in. long, with 1 or 2 reniform bracts: flowers 1·5 to 1·75 in. in diam. *Sepals* small, (·2 in. long) reniform, united at the base, reflexed, pubescent. *Petals* oblong-oblanceolate, subacute, about ·75 in. long, sub-coriaceous, puberulous. *Anthers* sessile in very few rows, flattened; the connective slightly produced, flattened, oblique. *Ovaries* numerous, angled, puberulous, with a few long projecting hairs near the apex. *Torus* of the fruit small, sub-globular, pubescent. *Ripe carpels* numerous, stalked, cylindric-oblong, oblique, curved, slightly apiculate, rugulose, minutely rufous-pubescent, 1·25 to 1·5 in. long, and ·5 in. in diam. *Seeds* about 10, in 2 rows, compressed, shining. *Stalks* 1·25 to 1·5 in. long, rufous-tomentose.

Perak: King's Collector, No. 4011, Wray No. 1826.

2. Uvaria Hamiltoni, Hook. fil. and Thoms. Fl. Ind. 96. A

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powerful climber: young branches slender, softly rufous-tomentose, becoming glabrous. *Leaves* membranous, elliptic-oblong to elliptic, sometimes slightly obovate, acuminate; the base narrowed or rounded, sometimes slightly unequal, never cordate; upper surface adpressed-pubescent, almost glabrous when old, the midrib minutely rufous-tomentose; lower surface softly stellate-tomentose; main nerves 14 to 17 pairs, spreading, rather prominent beneath; length of blade 4 to 8 in., breadth 2·25 to 3·5 in., petiole ·15 to ·2 in. *Peduncles* solitary or 2 to 3 together, ·75 to 1·75 in. long, extra-axillary, 1-flowered; flowers 1·5 to 2·5 in. in diam.: bract single, sub-orbicular, rufous-tomentose outside, shortly hispid inside: buds turbinate, tomentose. *Sepals* broadly triangular, ultimately reflexed, membranous. *Petals* much longer than the sepals, coriaceous, obovate, the apices obtuse and incurved, minutely tomentose on both surfaces, brick-red. *Anthers* sub-sessile, equal, obliquely truncate at the apex, ·15 to ·2 in. long. *Ovaries* slightly shorter than the stamens, compressed, pubescent. *Torus* hemispheric, tomentose, pitted when adult. *Ripe carpels* on long slender stalks, ovoid to sub-globular, about 1·5 in. long, and 1 in. in diam. when fresh, tomentose, scarlet; when dry slightly constricted between the seeds; stalks slender, tomentose, 1 to 1·5 in. long. *Seeds* about 6, flat, shining. Hook fil. Fl. Br. Ind. I, 48. *U. grandiflora*, Wall. Cat. 6485 E.

In the Forests at the base of the Eastern Himalaya; Madhopore Forest in E. Bengal: Assam; Khasia; Shan Hills (Prazer).

Var. *Kurzii*, King. Leaves with broader bases often minutely cordate; fewer nerves (12 to 14 pairs); smaller flowers (1·3 in. in diam.) on shorter pedicels (1 to 1·25 in.); petals yellowish, ovate-oblong.

South Andaman: Kurz, Kings' Collector.

This was referred by Kurz who first collected it, to *U. macrophylla*, Roxb., then to *U. purpurea*, Bl.: but was finally considered by him as "altogether doubtful." The fuller materials recently received show it to be, in my opinion, a very distinct variety of *U. Hamiltoni*, allied no doubt to *U. purpurea*, Bl., but a much larger plant with smaller flowers and more globular fruit.

3. Uvaria dulcis, Dunal Anon. 90, t. 13. A powerful creeper often 80 to 100 feet long; youngest branches softly cinereous-tomentose; the older sub-glabrous or glabrous, dark-coloured, rather rough. *Leaves* coriaceous, elliptic or oval, sometimes unequal-sided, acute or sub-acute; the base broad, rounded, or sub-truncate, minutely cordate; upper surface sparsely adpressed-stellate-pubescent. The midrib ferruginous-tomentose; lower surface densely sub-ferrugineous or cinereous woolly-tomentose: main nerves 8 to 10 pairs, spreading, slightly curving, prominent beneath: length of blade 4·5 to 7 in., breadth 2·5 to 3·5 in.,

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petiole ·2 in., stout. *Peduncles* ·5 in. long, lateral, not axillary, 1-flowered, solitary or 2 to 3 together, each bearing a small ovate deciduous bract; buds ovoid-globose, tomentose; flowers 1·25 to 1·5 in. in diam. *Sepals* broadly triangular, sub-acute, slightly reflexed, fleshy, tomentose on both surfaces. *Petals* much longer than the sepals, sub-coriaceous, broadly ovate, sub-acute, sub-reflexed, minutely tomentose on the outer surface; pubescent on the inner. *Stamens* and *pistils* forming a compact hemispheric mass; anthers sub-sessile, ·1 in. long, the connective much produced at the apex, compressed, oblique. *Ovaries* numerous, densely crowded, slightly shorter than the stamens, tomentose. *Torus* depressed-hemispheric, stellate-tomentose, pitted when adult. *Ripe carpels* numerous, stalked, ovoid, oblique, blunt, much and unequally tuberculate, densely and loosely ferruginous stellate-tomentose as are the 1 in. long stalks. DC. Prod. I, 88; Hook. fil. and Th. Fl. Ind. 98; Miq. Fl. Ind. Bat. I, Pt. 2, p. 24; Ann. Mus. Lugd. Bat. II, 8. *U. javana*, Dunal Anon. 91, t. 14; Blume Bijdr. 12; Fl. Javæ t. 3 and 13 B.; DC. Prod. I, 88? *U. aurita* Blume Fl. Javæ t. 3.

Malacca, Griffith; Maingay (Kew Destrib.), No. 25. Perak, King's Collector. Penang, Curtis, No. 1414.

As regards the size of its leaves and the colour of its flowers (which appear to vary from green though yellow to purple) this is rather a variable species. One of its forms, barely distinguishable from the type, was named *U. javana* by Dunal who also gave a figure of it. Blume, who again figured *U. javana*, distinguished it from *U. dulcis* by the stellate (not simple) hairs on the upper surface of its leaves. But, as Hook. fil. and Th. point out (Fl. Ind. 98), both kinds of hairs occur on the same leaf. In all the specimens named *U. javana*, received from the Dutch Botanists, the leaves are much smaller and less denselly woolly below than those collected in the Malay Peninsula. Miquel suggests that *U. aurita*, Bl. is only a form of this. By neither figuring nor describing the fruit of what he understood as *U. dulcis*, *aurita* and *javana*, Blume neglected one of the best characters in this rather perplexing genus; and it may be that when fruit of the small-leaved Java species issued from the Herbarium of Buitenzorg shall be forthcoming, the reductions above made will have to be cancelled.

4. Uvaria Lobbiana, H. f. and T. Fl. Ind. 100. A powerful climber, often reaching 100 to 150 feet in length: young branches pubescent, ultimately glabrous and dark-coloured. *Leaves* sub-coriaceous, oblong or oblong-oblanceolate, acute or very shortly acuminate, rarely obtuse, narrowed to the rounded or sub-cordate base; both surfaces when very young stellate furfuraceous, speedily becoming glabrous except the puberulous midrib; the upper (when dry) pale green, the lower brown: main

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nerves 13 to 16 pairs, curving slightly, spreading below, suberect above, thin but prominent beneath; length of blade 4 to 7 in., breadth 1·5 to 2·25 in., petiole ·25 in. *Peduncles* only ·25 in. long or even less, terminal or leaf-opposed, 2-or 3-flowered, tomentose, each flower with a large rotund amplexicaul bract; buds depressed-globose, tomentose: flower 1 to 1·2 in. in diam. *Sepals* conjoined into a wavy cup, tomentose outside, minutely pubescent inside. *Petals* coriaceous, often 7 or 8, slightly unequal, broadly oval, obovate, blunt; slightly warted on both surfaces, minutely tomentose on the outer, pubescent on the inner. *Anthers* sessile, flattened, ·1 in. long, the connectives produced at the apices, compressed, obliquely truncate, the outer row sterile. *Ovaries* 4-angled, pubescent except the truncate lobulate stigma. *Ripe carpels* numerous, stalked, globular or globular-ovoid, slightly oblique, boldly tubercled, pubescent, ·5 to ·75 in. in diam., and sometimes 1 in. long; pericarp thin; stalks slender, 1·5 to 2 in. long, glabrescent. *Seeds* 4 to 10, large, plano-convex, smooth. Miq. Fl. Ind. Bat. I, Pt. 2, 34: Hook. fil. Fl. Br. Ind. I, 49.

Malacca; Griffith, Maingay (Kew Distrib.), Nos. 27 and 30. Singapore and Perak; King's Collector. Penang; Curtis. Sumatra; Forbes, No. 3059.

5. Uvaria macrophylla, Roxb. Fl. Ind. II, 663. Scandent usually to the extent of 15 to 20 feet, but sometimes reaching 50 or 60 feet; young branches and petioles rusty-tomentose. *Leaves* coriaceous, elliptic-oblong, rarely elliptic-rotund, sometimes slightly obovate, obtuse or shortly and abruptly acuminate, very slightly narrowed to the rounded or minutely cordate base; upper surface (when adult) glabrescent or glabrous except the tomentose midrib and nerves; lower with lax, sometimes stellate, rusty tomentum, especially along the midrib and 11 to 18 pairs of prominent spreading or oblique nerves: length of blade 4·5 to 10 in., breadth 2·5 to 4 or (in some Burmese specimens) even 6 in.; petiole ·25 in. *Peduncles* extra-axillary or terminal, densely rusty-tomentose, 3-to 5-flowered, each pedicel with an oval or rounded bract; buds globose: flowers 1·5 in. in diam. *Sepals* connate into a cup with wavy obscurely 3-toothed edge. *Petals* much larger than the calyx, subrotund, blunt, coriaceous, purple, tomentose outside, pubescent inside; anthers sessile, ·3 in. long: the connective produced at the apex to nearly half the length of anther, compressed, obliquely truncate. *Ovaries* narrow, compressed, tomentose, the stigmas truncate, *Torus* of fruit woody, hemispheric, 1 in. in diam. sparsely pubescent, pitted. *Ripe carpels* stalked, oblong, blunt at each end, glabrous, ·75 to 1·25 in. long, pericarp thin; stalks ·5 to 1 in. long: seeds numerous, oval, compressed, shining. Wall. Pl. As. Rar. t. 122; Cat. 6487 (excl. F. in fruit) Hk. f.

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and Th. Fl. Ind. 97; Hook. fil. Fl. Br. Ind. I, 49; Miq. Fl. Ind. Bat. 1 Pt. 2, p. 23; Thwaites Enum. Pt. Ceyl. 6; Kurz Fl. Burm. I, p. 28; Beddome Ic. Pl. Ind. Or. t. 81. *U. rufescens*, DC. Mem. Anon. 26. *U. cordata*, Wall. Cat. 6486. *Guatteria cordata*, Dunal Anon. 129 t. 30; DC. Prod. I, 93.

Silhet, Chittagong, Burmah, Malayan Peninsula, Java, Ceylon.

One of the most widely distributed species of the genus and closely allied to *U. ovalifolia*, Bl. I reduce to this species the *Uvaria cordata* of Wall. Cat., No. 6486; but not without some hesitation, as both Miquel and Kurz referred it to *U. ovalifolia*, Bl.

6. Uvaria purpurea, Blume Bijdr. 11: Fl. Jav. 13, t. 1 and t. 13 A. A sarmentose shrub, often climbing to 20 or 30 feet: young parts softly stellate-rufous-pubescent or tomentose. *Leaves* thickly membranous, oblong-lanceolate to elliptic-oblong, sometimes slightly obovate, acute or acuminate, the base rounded or slightly cordate, shortly petiolate; upper surface, when adult, shining, glabrous or glabrescent, the midrib and sometimes the nerves tomentose; under surface rather sparsely but softly stellate-tomentose; main nerves 14 to 17 pairs, rather straight, prominent beneath, the lower spreading, the upper sub-erect; length 4·5 to 9 or even 11 in., breadth 2·5 to 3·75 in.; petiole ·15 to ·25 in. *Peduncles* 1 to 1·5 in. long, extra-axillary or terminal, usually 1- sometimes 2-flowered; flowers 2 to 3 in. diam.; bracts 2, large, unequal, leafy; buds turbinate. *Sepals* broadly triangular, sub-concave, membranous, fulvous-tomentose on the outer, glabrescent on the inner surface. *Petals* longer than the sepals, coriaceous, oblong to obovate, obtuse, coriaceous, dark purple, the inner 3 slightly smaller. *Anthers* sub-sessile, very numerous, equal, about ·3 in. long; the connective much produced at the apex, rhomboid in the inner, compressed and oblique in the outer anthers. *Ovaries* numerous, densely crowded, slightly shorter than the stamens, tomentose; ovules numerous. *Torus* depressed-hemispheric, pubescent, pitted when ripe. *Ripe carpels* numerous, stalked, oblong-cylindric, blunt at each end with 2, more or less obscure, ridges and grooves, minutely rufous-tomentose, sub-tuberculate, 1·5 to 2 in. long and about ·5 in. in diam.; stalks ·5 to 1 in. long, rufous-tomentose. *Seeds* numerous, flat. Hook. fil. and Thoms. Fl. Ind. 95; Miq. Fl. Ind. Bat. I, Pt. 2, 22; Ann. Mus. Lugd. Bat. II, 6; Hook. fil. Fl. Br. Ind. I, 47; Benth. Fl. Hong Kong, 9; Vidal y Soler, Revis. Fl. Filipinas, 39; Scheffer Obs. Phyt. I, 4, 26, 65; Ann. Jard. Bot. Buitenz. II, 1. *U. grandiflora*, Roxb. Fl. Ind. II, 665; Wall. Pl. As. Rar. II t. 121; Wall. Cat. 6485, A. to D. and H.; Wight and Arn. Prod. 9. *U. platypetala*, Champ. in Kew Journ. Bot. III, 257. *U. rhodantha*, Hance in Walp. Ann. II, 19. *Unona grandiflora*, DC. Prod. I, 90.



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In all the provinces. Distrib: Malayan Archipelago, S. China, Phillipines.

Var. *tuberculata;* fruits prominently tuberculate.

Perak; King's Collector, Nos. 960, 4786.

A plant collected in the island of Bangka, closely resembling this in leaves, but with larger flowers with yellow petals, has been described by Messrs. Teysmann and Binnendyk under the name of *U. flava* (Nat. Tijds. Ned. Ind. XXIX, 419). It has also been figured by Miquel (Ann. Mus. Lugd. Bat. II, 6, t. 1). I fear it is merely a form of *U. purpurea;* but not having seen fruiting specimens, I hesitate to reduce it here.

7. Uvaria hirsuta, Jack Mal. Misc. (Hook. Bot. Misc. II, 87.) A sarmentose shrub but often climbing to the length of from 15 to 50 feet: young branches and petioles with numerous rather stiff reddish-brown hairs. *Leaves* thinly coriaceous, narrowly elliptic to elliptic-oblong, rarely obovate-oblong, acute or sub-acute, the base rounded or minutely cordate; upper surface with scattered sub-adpressed, stiff, mostly simple hairs, the midrib tomentose; lower surface with more numerous stellate and simple hairs: main nerves 9 to 14 pairs, spreading, depressed on the upper surface (when dry) but prominent on the lower; length 4 to 7 in., breadth 2·25 to 3·25 in., petiole ·2 in. *Peduncles* 1 to 2 in. long, lateral or terminal, not axillary, 1- rarely 2-flowered; flowers 1·25 to 1·5 in. in diam.; bract solitary (rarely 2 or 3), lanceolate, deciduous: buds ovoid-globose, stiffly hairy. *Sepals* membranous, broadly ovate, acute, connate, pilose outside, reflexed. *Petals* red, larger than the sepals, broadly ovate, acute; outside tomentose with stiff hairs intermixed, inside sub-glabrous; anthers ·15 in. long, sub-sessile, the connective at the apex often slightly produced and obtuse. *Ovaries* 4-angled, truncate, rufous-tomentose, shorter than the anthers. *Ripe carpels* numerous, stalked, cylindric, blunt, 1·5 to 2 in. long, covered (as are the stalks and torus) with dense darkly ferruginous tomentum mixed with stiff hairs: stalks 1 to 1·25 in. long: torus hemispheric: seeds numerous, ovoid, plano-convex. Blume Fl. Javae, Anon. 22, t. 5; Wall. Cat. 6458 (excl. C.); Hook. fil. and Thoms. Fl. Ind. 99; Hook fil. Fl. Br. Ind, I, 48; Miq. Fl. Ind. Bat. I, Pt. 2, p. 24; Ann. Mus. Lugd. Bat. II, 8; Scheff. in Nat. Tijdsch. XXXI, 2; Zoll. in Linnæa XXIX, 304; Kurz Flora Burm. I, 28; Scheff. Observ. Phyt. I, 2. *U. trichomalla*, Bl. Fl. Jav. Anon. 42, t. 18. *U. velutina*, Blume (not of Roxb.) Bijdr. 13. *U. pilosa*, Roxb. Fl. Ind. II, 665.

In all the provinces. Distrib. Malayan Archipelago and Burmah.

There is some difference amongst individuals as to the breadth of the leaves, and on one of the forms with comparatively short but broad leaves Blume founded his species *U. trichomalla.*

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8. Uvaria Curtisii, King n. sp. A large climber: young branches densely rusty-tomentose, slender. *Leaves* oblong-lanceolate, sometimes slightly oblanceolate, acuminate, slightly narrowed to the rounded base; upper surface glabrous except the strong rusty-tomentose midrib and the nerves; under surface stellate-rufous-tomentose, especially on the midrib, reticulations, and 7 to 12 pairs of ascending, curving, bold main nerves: length 4 to 9 in., breadth 1·7 to 3·25 in.; petiole ·15 to ·2 in., stout. *Flowers* 1 to 1·25 in. in diam., solitary or in pairs, axillary: pedicels 1 to 1·75 in., densely tomentose like the outer surface of the sepals, and with an ovate supra-median bracteole. *Sepals* broadly ovate, concave, spreading, puberulous within, ·35 in. long. *Petals* thinly leathery, white, subequal, ovate-oblong, obtuse; the outer rather broader than the inner, ·5 in. long, puberulous on both surfaces but especially on the outer. *Stamens* numerous, all perfect; connective truncate at the apex, not prolonged into a process; the anthers linear, lateral. *Ovaries* numerous, crowded, elongate, 3-angled, tomentose, with 12 ovules in 2 rows: stigma sessile, large, sub-capitate, corrugated, glabrous. *Ripe carpels* unknown.

Perak; on Ulu Bubong, King's Collector, No. 8543. Penang; elev. 2,000 feet. Curtis No 1415.

9. Uvaria Ridleyi, King n. sp. A strong climber; young branches slender, stellate-rufous-tomentose, ultimately dark-coloured, striate; sparsely lenticellate. *Leaves* sub-coriaceous, elliptic-oblong, acuminate, slightly narrowed to the rounded base; both surfaces with short, stellate, rather pale hairs, scabrid on the upper, soft on the lower surface; the midrib and 10 to 15 pairs of spreading curving slightly prominent main nerves softly rufous-stellate-tomentose on both surfaces; length 3 to 5 in., breadth 1·3 to 2 in.; petiole ·15 in., stellate-tomentose. *Flowers* ·75 to 1·2 in. in diam., 2 or 3 together in short supra-axillary cymes; pedicels stellate-tomentose like the outer surface of the calyx, ·3 or ·4 in. long, with a large orbicular amplexicaul bracteole. *Sepals* orbicular, connate into an obscurely 3-toothed spreading cup ·4 in. in diam., glabrescent inside. *Petals* spreading, sub-orbicular to broadly oblong, very blunt, subequal, rather thin, minutely pubescent on both surfaces but especially on the outer, dark reddish-brown. *Stamens* numerous (the outer row converted into sub-quadrate staminodes) compressed, broad, without filaments; the apical process of the connective broad and flat: anther-cells on the edges of the connective, linear. *Ovaries* numerous, crowded, elongate, narrow, compressed, ridged, minutely stellate-tomentose, the ovules numerous; stigma sessile, short and broad, fleshy, obliquely truncate. *Ripe carpels* ovoid or obovoid, blunt at both ends, minutely pubescent, 1·2 to 1·5 in. long: stalks nearly 1 in., stellate-tomentose.

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*Seeds* numerous in two rows, horizontal, oval, compressed, pale brown, shining.

Pahang: Ridley. Perak: Scortechini.

10. Uvaria pauciovulata, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 51. A sub-scandent shrub: young branches densely stellate rufous-tomentose. *Leaves* coriaceous, rigid, narrowly elliptic or elliptic-oblong, obtuse or obtusely acuminate, the base rounded or cordate; upper surface (in adult leaves) shining, quite glabrous; the lower dull, sparsely pubescent; main nerves 10 to 14 pairs, sub-ascending, curving, prominent beneath and impressed above: length of blade 2·5 to 6 in., breadth 1·25 to 3 in., petiole ·2 in. *Racemes* terminal, umbellate, few-flowered, 1·5 to 2·5 in. long, scurfily rufous-tomentose; bracts numerous and imbricate towards the apex, rotund to ovate, tomentose: buds ovoid-globose: flowers 1·5 in. in diam. *Sepals* small, (·3 in. long) orbicular, sub-acute, connate to the middle and densely tomentose outside, densely and minutely puberulous inside. *Petals* very much larger than the sepals, sub-connivent, coriaceous, ovate-rotund, obtuse, the inner 3 narrower; all scaly-tomentose externally, densely and minutely pubescent and veined internally; anthers sub-sessile, cuneate; connective slightly produced at the apex, truncate; ovaries longer than the stamens, flattened, stellate-hairy; stigma truncate, ovules 1 to 3. *Ripe carpels* numerous, stalked, sub-globose, mucronate, densely and minutely fulvous-tomentose, ·35 to ·5 in. in diam., 1- to 2-seeded; stalk ·5 to ·75 in., rather slender. *Seeds* compressed, shining.

Malacca; Maingay (Kew Distrib.), No. 104. Penang: Curtis, No. 825: at elevations of 500 to 600 feet.

11. Uvaria Scortechinii, King n. sp. A sarmentose, flexuose shrub; young branches and petioles densely covered with rusty, floccose, rufous tomentum. *Leaves* coriaceous, elliptic to elliptic-rotund, obtuse, very slightly or not at all narrowed to the rounded or minutely cordate base: upper surface shining, glabrescent or glabrous, the deeply impressed midrib and nerves tomentose, transverse veins depressed when dry; under surface minutely and softly rufous, pubescent especially on the midrib nerves and reticulations which are all bold and prominent: main nerves 10 to 12 pairs, spreading below, sub-ascending above, forming double arches within the edge: length of blade 4 to 7 in., breadth 2·5 to 4 in., petiole ·2 to ·4 in. *Flowers* 1·5 in. in diam., either terminal in umbels of 2 or 3, or in many-flowered lateral panicles 4 in. in length: peduncles ·5 to ·75 in. long; bracts numerous, but chiefly towards the apices of the peduncles, ovate-orbicular, covered with short rufous flocculent tomentum as are the branches and axes of the panicles. *Sepals* fleshy, triangular, sub-acute, connate in the lower third, concave,

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spreading, minutely pubescent. *Petals* fleshy, about 1 in. long, connivent; the outer 3 ovate-rotund, very obtuse, tomentose-pubescent on both surfaces, the outer surface with some small superficial scales, the inner with a round glabrous spot at the base: inner 3 petals obovate, clawed, pubescent outside, glabrous inside except a broad pubescent band near the apex. *Anthers* sessile, angled, the connective projecting beyond the apex, broadly truncate, almost peltate. *Ovaries* (fide Scortechini) "several, with few stellate hairs, 2–3 ovuled: style cylindric, curved, glabrous." *Fruit* unknown.

Perak: Scortechini, No. 1990.

Scortechini's are the only specimens I have seen, and they have flowers only.

12. UVARIA MICRANTHA, H. f. and Th. Fl. Ind. 103. A large climber; young branches slender, softly rufous-tomentose, afterwards glabrous, striate, and dark-coloured with pale warts. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, the base rounded or slightly cuneate; both surfaces glabrous except the rufous-pubescent midrib: main nerves scarcely visible (even when dry), 12 to 15 pairs, spreading; length of blade 2·5 to 5·5 in., breadth ·8 to 1·4 in., petiole ·15 in. *Peduncles* terminal or extra-axillary, very short, 2-to 4-flowered, softly rufous-tomentose, bracts more or less orbicular; buds globose, slightly pointed, ·15 in. in diam.; flowers ·4 in. in diam. *Sepals* sub-rotund, densely pubescent outside, sub-glabrous inside. *Petals* broadly ovate, sub-obtuse, granular and minutely tomentose outside, pubescent inside. *Ripe carpels* numerous, stalked, ovoid-globose, rounded at each end, glabrous, 2- to 4-seeded. *Seeds* plano-convex, smooth; Hook. fil. Fl. Br. Ind. 1, 51; Kurz Fl. Burm. I, 22; Miq Fl. Ind. Bat. I, Pt. 2, 26; *Uvaria sumatrana*, Kurz Andam. Report, 29; Hook. fil. Fl. Br. Ind. I. 51. ? *Uvaria elegans*, Wall. Cat. 6474 B. *Guatteria micrantha*, A. DC. Mem. 42; Wall. Cat. 6449. *Polyalthia fruticans*, A. DC. l c. 42; Wall. Cat. 6430. *Anaxagorea sumatrana*, Miq. Fl. Ind. Bat. Suppl. 382.

Burmah, Malacca, Penang. Distrib. Sumatra.

As regards leaves, this closely resembles *Popowia nitida*, King—a plant of the Andaman and Nicobar Islands; and there is reason to believe that some specimens of that *Popowia* from those islands have been issued from the Calcutta Herbarium as *Uvaria micrantha*. I am also of opinion that *Uvaria sumatrana*, Kurz Andaman Report, 29, and of Hook. fil. and Thoms. Fl. B. Ind. I, 51, is possibly *Popowia nitida*, King.

13. UVARIA ANDAMANICA, King n. sp. Scandent: young branches rather stout, scurfily stellate-tomentose. *Leaves* oblong-oblanceolate, shortly acuminate, much narrowed to the rounded, unequal, or minutely

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cordate base; upper surface glabrous, the midrib and sometimes the nerves coarsely puberulous; under-surface reticulate, stellate-rufous-pubescent on the midrib and 18 to 22 pairs of spreading curving nerves; length 5·5 to 9 in., breadth 1·75 to 4 in.; petiole ·3 in., tubercular. *Flowers* small, in short terminal or axillary cymes, rarely solitary: pedicels ·3 in. long, densely covered like the outside of the sepals with sub-deciduous coarse, rusty, stellate tomentum; bracteole solitary, orbicular, ovate, close to the flower. *Sepals* valvate, orbicular, partly connate, glabrous inside. *Petals* imbricate, orbicular, fleshy, more or less puberulous outside, glabrous within; the inner rather smaller than the outer but both under (in the young state) ·25 in. in diam. *Stamens* numerous, narrowly elongate, the apex truncate more or less obliquely; anther-cells lateral. *Ovaries* absent in the staminiferous flower. *Ripe carpels* oblong, blunt (almost truncate) at each end, slightly tuberculate and densely covered with loose, sub-deciduous, rusty-stellate tomentum: pericarp rather thick. *Seeds* about 8 in 2 rows, plano-convex.

South Andaman; King's Collector.

This has been collected only on two occasions, once with undeveloped male flowers and once with immature fruit. The full size attained by the flowers is not known, and the measurements of sepals and petals above given are taken from buds. By its leaves and peculiar deciduous rusty stellate tomentum, the species is however readily recognisable.

14. Uvaria excelsa, Wall. Cat. 6477. A creeper 30 to 100 feet long: young parts stellate-pubescent; the branchlets tawny-tomentose, speedily becoming glabrous dark-coloured and furrowed. *Leaves* coriaceous, oblanceolate, obovate-oblong to elliptic, the apex acuminate (sometimes very shortly), acute, rarely obtuse, slightly narrowed to the minutely cordate base: upper surface shining, glabrous except the puberulous depressed midrib; lower surface minutely tawny-tomentose; main nerves 10 to 12 pairs spreading, slender; length 3·5 to 7·5 in., breadth 1·5 to 4 in.; petiole ·3 to ·5 in. pubescent. *Flowers* white, ·35 to ·4 in. in diam., in contracted cymes from the branches below the leaves, or axillary; pedicels only about ·2 in. long, rufous-tomentose with a large bract close to the flower. *Sepals* semi-orbicular, sub-acute, valvate, concave, spreading, tomentose outside, glabrous within. *Petals* in bud imbricate only at their apices, sub-equal, thick, concave, densely and minutely pubescent on both surfaces: the outer broadly ovate, acute, a little larger than the sepals: inner petals ovate, about as large as the sepals. *Anthers* numerous, narrow, the cells linear, lateral; the apical process of the connective thick, sub-quadrate, obliquely truncate, minutely pubescent. *Ovuries* narrow, elongate, grooved, pubescent; the

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stigma thick, sub-capitate, sub-truncate; ovules numerous, in two rows. *Ripe carpels* sub-globular, slightly obovoid, blunt at each end, densely and minutely tomentose, 1·1 in. long and ·9 in. in diam. *Seeds* about 14 in two rows, horizontal, half-oval, flat, smooth, brown. *Mitrephora excelsa*, H. f. and T. Fl. Ind. 114: Hook. fil. Fl. Br. Ind. I, 77; Miq. Fl. Ind. Bat. I, Pt. 2, 31.

Penang: Wallich, Curtis. Perak: King's Collector. Scortechini. Malacca: Maingay (Kew Distrib.), No. 36 *in part.*

This plant was originally issued as a *Uvaria* by Wallich. His specimens of it, however, bore no mature flowers; and Sir Joseph Hooker and Dr. Thomson referred them doubtfully to *Mitrephora*. The excellent specimens recently collected by Mr. Curtis and by the Calcutta Garden Collector show the petals to be sub-equal and concave, imbricate at the apex only, the sepals being quite valvate. This of course is not the typical flower of a *Uvaria*, in which the petals are *much* imbricate. But the stamens, ovaries and ripe fruit are more those of *Uvaria* than of any other genus.

15. Uvaria astrosticta, Miq Fl. Ind. Bat. Suppl. 370. A climber? Young branches deciduously rufous-stellate-tomentose with simple hairs intermixed, ultimately glabrous striate and dark-coloured. *Leaves* coriaceous, oblong-lanceolate, sometimes slightly oblanceolate, acuminate, the base rounded or minutely cordate; upper surface minutely scaberulous, the midrib and sometimes the nerves softly rufous-pubescent; lower surface at first densely and softly tomentose, ultimately sparsely stellate-pubescent, sub-scaberulous; main nerves 12 to 16 pairs, spreading, rather prominent on the lower surface: length of blade 4 to 6 in., breadth 1·5 to 1·8 in., petiole ·2 in. *Peduncles* extra-axillary, very short (only ·3 in.), 2-to 3-flowered, rufous-stellate-tomentose as are the 2 or 3 sub-rotund bracts; buds sub-globular; flowers ·6 in. in diam. *Sepals* reniform, sub-acute, united half way. *Petals* nearly three times as long as the sepals, sub-coriaceous, broadly oval, slightly obovate, sub-acute, minutely pubescent. *Anthers* sub-sessile, the connective produced beyond the apices, flattened and truncate, 3 outer anthers barren: torus hispidulous. *Fruit* unknown; Miq. Ann. Mus. Lugd. Bat. II. 8.

Perak; Scortechini, No. 121. Distrib. E. Sumatra.

The Perak specimens of this plant agree perfectly with those from Sumatra on which the species was founded. It is allied to *U. heterocarpa* Bl., to *U. rufa* Bl., and also to *U. timoriensis*. I have never seen the fruit, and Miquel's entire description of it consists of the two words "carpella velutina."

*Doubtful Species.*

16. Uvaria sub-repanda, Wall. Cat. 6483. A climber: young

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branches very slender, rather sparsely scurfy-pubescent. *Leaves* membranous, oblong or obovate-oblong, acute, the base rounded: upper surface shining, glabrous except the pubescent midrib; under-surface pale, yellowish-brown when dry, dull, at first puberulous, ultimately quite glabrous including the midrib, the reticulations distinct; main nerves 10 to 14 pairs, spreading, thin but rather prominent beneath: length of blade 5 to 7·5 in., breadth 2 to 2·25 in.; petiole ·15 to ·25 in., densely scaly-pubescent. *Peduncles* axillary, rufous-stellate-tomentose, 1-flowered; bracts cucullate, sub-orbicular. *Petals* narrowly oblong. *Ripe carpels* unknown. Hook. fil. and Thoms. Fl. Ind. 101: Hook. fil. Fl. Br. Ind. I. 50.

Singapore, Wallich.

A very imperfectly known species, the only specimens being Wallich's which are not good and which are in flower only. The only other specimen which agrees with Wallich's specimens as to leaves and branches is from Penang (Curtis No. 1408): but this has a short 2-flowered, extra-axillary peduncle, and I hesitate to identify it with *U. sub-repanda.*

### 5. Ellipeia, H. f. and T.

Characters of *Uvaria*, but with solitary, ventral or sub-basal ovule and 1-seeded carpels, the style sometimes elongate.

Distrib. Malaya: species 10 or 11.

Flowers all hermaphrodite.

Flowers in groups.

Leaves oblong or narrowly obovate-oblong, acuminate, pubescent, puberulous or glaberulous beneath: flowers in short panicles ... ... ... 1. *E. cuneifolia.*

Leaves obovate-oblong, obtuse, softly tomentose beneath, peduncles 3- or 4-flowered 2. *E. leptopoda.*

Leaves oblong or elliptic-oblong, acute, glabrous, cymes 3-to 5-flowered ... 3. *E. glabra.*

Flowers solitary.

Leaves oblong-lanceolate to ovate-lanceolate, acuminate, minutely granular above when dry ... ... ... 4. *E. costata.*

Flowers unisexual or polygamous, solitary or in pairs.

Leaves shortly acuminate, both surfaces minutely granular when dry, not reticulate: stalks of carpels ·15 in. long ... ... 5. *E. pumila.*

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Leaves acute, rarely acuminate, not granular, reticulations transverse and very distinct; stalks of carpels ·75 to 1 in. long ... 6. *E. nervosa.*

1. ELLIPEIA CUNEIFOLIA, H. f. and T. Fl. Ind. 104. A climber 20 to 100 feet long: young branches at first shortly and densely rufous-tomentose, ultimately sub-glabrous. *Leaves* thinly coriaceous, oblong or narrowly obovate-oblong, the apex broadly abruptly and shortly acuminate, the base rounded or sub-cordate: upper surface glabrous, shining, the midrib and often the main nerves tomentose; lower minutely rufous-tomentose to pubescent, very often glaberulous: main nerves 16 to 19 pairs, spreading to sub-ascending, prominent beneath: length of blade 4 to 7 in., breadth 1·5 to 3 in.; petiole ·15 to ·2 in., tomentose. *Flowers* ·75 to 1 in. in diam., in short few-flowered pedunculate rufous-tomentose panicles; bracts at the bases of the pedicels ovate, that at the base of the flower rotund: pedicels ·25 to ·4 in. long: buds ovoid-conic. *Sepals* small, fleshy; sub-orbicular, slightly united below, spreading, coriaceous, tomentose. *Petals* fleshy, connivent; outer 3 much larger than the sepals, rotund, densely pubescent on both surfaces; inner 3 not much larger than the sepals, rotund, pubescent externally, glabrous internally. *Anthers* sessile, short, the cells on the outer surface; the apex with a broad, round, oblique, truncate appendage from the connective; pistils oblong, tapering to each end, pubescent. *Torus* small, sub-globose. *Ripe carpels* numerous, on long stalks, ovoid, oblique, blunt, with a faint partial ridge and a short lateral, conical process, minutely yellowish-tomentose. *Seed* smooth, ovoid. Hook. Ic. Plant. t. 1025; Hook. fil. Fl. Br. Ind. I, 52.

Malacca: Griffith, Maingay (Kew Distrib.) No. 31. Perak, very common.

In the Perak specimens the tomentum on the under-surface of the leaves is usually less dense than in specimens from Malacca: moreover the flowers are smaller in the Perak specimens, and the floral bract is not close to the calyx but a little way under it. In other respects, however, they agree.

2. ELLIPEIA LEPTOPODA, King, n. sp. A climber, 50 to 70 feet long: young branches and petioles densely covered with scurfy cinereous tomentum. *Leaves* coriaceous, obovate-oblong, rarely elliptic, obtuse, or with a very short blunt apiculus, narrowed in the lower half to the minutely cordate, rarely entire, base: upper surface pale-green when dry, sparsely and minutely stellate-pubescent when young, afterwards glabrous except the pubescent midrib: lower surface densely covered with soft, short, dense, pale brown tomentum; main nerves 10 to 12 pairs, spreading, obsolete on the upper, slightly prominent on the lower, surface: length of blade 3·5 to 5 in., breadth 2·25 to 2·5 in., petiole ·2 to



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·25 in. *Peduncles* extra-axillary, about ·5 in. long; the flowers 3 or 4 on short pedicels, each subtended by a rotund-obovate, cucullate bract; the whole inflorescence and calyx rather sparsely stellate-tomentose: buds depressed-globose: flower ·75 in. in diam. *Sepals* often 4 in number, semi-orbicular, very obtuse, slightly united below, spreading. *Petals* coriaceous, three times as long as the sepals, ovate-rotund, obtuse, recurved, minutely pubescent on both surfaces, dark crimson. *Anthers* sessile, very small, the connective produced beyond the apex, flattened, oblique. *Ovaries* about as long as the anthers; the stigmas truncate, hairy. *Torus* hemispheric. *Carpels* numerous, on long slender stalks, ovate-rotund, ·5 in. long, slightly oblique with a slight lateral beak, minutely cinereous-pubescent. *Stalks* slightly thickened and ridged towards the apex, 1·5 to 2·5 in. long. *Seed* ovoid, flattened on one side, smooth.

Perak; at low elevations, King's Collector. Singapore, Ridley.

A species in its leaves resembling *Uvaria heterocarpa*, Bl. but with different fruit: also like *U. timorensis*, Miq., but with much more obovate leaves.

3. ELLIPEIA GLABRA, H. f. and T. Fl. Br. Ind. I, 52. A tree: young branches and inflorescence brown-pubescent. *Leaves* coriaceous, oblong or elliptic-oblong; the base rounded or acute; both surfaces glabrous, not shining, the upper rigid, the lower paler and reticulate: main nerves about 9 pairs, curved, sub-ascending, prominent beneath; length 4 to 5·5 in., breadth 1·5 to 2 in., petiole ·25 in. *Cymes* shortly pedunculate, axillary, 3- to 5-flowered, 1 to 1·5 in. long. *Flowers* 1·5 in. in diam.; bracteole oblong, sub-amplexicaul, recurved. *Sepals* ovate-lanceolate, acute, recurved, ·25 in. long. *Outer petals* obovate-lanceolate, sub-acute, flat, without claws, 1 in. long; the inner shorter, obovate, obtuse. *Ovaries* glabrous below, strigose above; ovule 1, erect (Maingay). *Ripe carpels* sub-globose, ·65 in. long; pedicels slender, ·75 to 1·25 in. long: pericarp thin. *Seed* oblong, pale, with a deep longitudinal furrow.

Malacca; Maingay No. 66 (Kew Distribution).

Except Maingay's I have seen no specimens of this.

4. ELLIPEIA COSTATA, King. A shrub about 10 feet high: young branches pale, rusty-tomentose. *Leaves* coriaceous, oblong-lanceolate to ovate-lanceolate, acuminate, the base cuneate: upper surface glabrous but rather rough; lower pale, softly and laxly pubescent, sub-glabrescent when old; main nerves 8 to 9 pairs, bold, sub-ascending, rather straight: length 4 to 6·5 in., breadth 2 to 2·5 in.; petiole ·25 in., tomentose. *Flowers* solitary, extra-axillary, ·75 to 1 in. in diam.: pedicels woody, tomentose, ·15 in. long, with 3 ovate acute bracts at their bases. *Sepals* ovate, obtuse, half as long as the petals and, like them, sericeous exter-

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nally and glabrous or sub-glabrous internally. *Petals* subequal, oblong, obtuse, ·35 to ·45 in. long. *Ripe carpels* ovoid-cylindric, slightly apiculate and shortly stalked, glabrous, ·8 in. long and ·35 in. in diam.; pericarp thin.

Burmah; on Moolyet at 5,000 ft. Gallatly.

I have seen no entire fruit of this species but only some loose carpels. When ripe they are said by Mr. Gallatly to be red.

ELLIPEIA PUMILA, King, n. sp. A shrub 2 to 8 feet high: young branches with minute pale rufous tomentum; when older dark-coloured, glabrous and furrowed. *Leaves* coriaceous, oblong-lanceolate to elliptic-lanceolate, tapering from the middle to the shortly acuminate apex and acute base; both surfaces minutely granular when dry, the upper glabrous; the lower sparsely adpressed-pubescent; the midrib rufous-pubescent; main nerves about 9 pairs, oblique, rather straight, faint on the lower surface, obsolete on the upper; length 4·5 to 7 in., breadth 1·5 to 2·25 in.; petiole ·25 to ·35 in., pubescent. *Flowers* solitary, or in pairs, extra-axillary, sub-sessile, ·75 in. in diam. when expanded, the buds globose; pedicels ·1 in. long, coarsely hirsute, bracteate. *Sepals* much shorter than the petals, broadly ovate, sub-acute, strigose-pubescent outside and sub-glabrous inside as are the petals. *Petals* imbricate, spreading, lanceolate or oblanceolate-oblong, the outer at first much shorter than, but ultimately sub-equal to, the inner. *Male-flower:* stamens numerous, with transversely elongate, truncate, heads; pistils 0. *Female flower* like the male but with fewer stamens; pistils about 10, pubescent, 1-ovuled; stigma short, flat, pubescent. *Carpels* 4 to 5, sub-cylindric, tapering to each end, ·75 in. long and ·25 in. diam., minutely granular and strigose; stalks tomentose, ·15 in. long; torus very small. *Seed* solitary, oblong, pale.

In leaves and in general facies this is very like *Popowia nervifolia*, Maing., but its petals are distinctly imbricate.

Perak on Ulu Bubong; King's Collector, Scortechini.

6. ELLIPEIA NERVOSA, Hook. fil. and Thoms. Fl. Br. Ind. I, 52. A tree 40 feet high; young branches glabrous, dark-coloured, slightly ridged. *Leaves* coriaceous with pellucid dots, elliptic-oblong, or lanceolate-oblong, acute or rarely shortly acuminate, the base acute; upper surface glabrous; the lower sparsely strigose, the reticulations transverse and very distinct; main nerves 10 or 11 pairs, oblique, rather straight; length 8 to 11 in., breadth 2 to 3·5; petiole ·35 to ·5 in. glabrous. *Flowers* polygamous, solitary, extra-axillary, rarely in pairs, ·75 in. in diam., globose; pedicels stout, ·1 to ·2 in. long, rufous-pilose, bracteate. *Sepals* broadly ovate, acute, pubescent, much smaller than the petals. *Petals* white, spreading, imbricate; the outer broadly ovate-oblong, ob-

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tuse; the inner rather shorter and narrower, oblong; all pubescent especially externally. *Stamens* in the male flowers numerous, with roundish flat heads. *Ovaries* in the female flower many, curved. *Carpels* rather numerous, ovoid, slightly apiculate, narrowed into the stalk, rose-red when ripe (Wray), about 1 in. long and ·5 in. in diam., glabrous; their stalks ·75 to 1 in. long.

Malacca; Maingay, (Kew Distrib.), No. 47. Perak; common at low elevations. Penang; Curtis.

In the texture and nervation of its leaves this species has a strong resemblance to *Popowia nervifolia*, Maing. and other species in its neighbourhood. But the petals are not those of a *Popowia*, both rows being distinctly imbricate. The fruit moreover is larger than that of *Popowia*, and the albumen is much more cellular in structure being, in this respect, like that of *Ellipeia cuneifolia*, H. f. & Th.

### 6. Cyathocalyx, Champion.

Trees. *Leaves* glabrous. *Flowers* fascicled, terminal or leaf-opposed. *Sepals* free or united into a 3-lobed cup. *Petals* 6, 2-seriate, valvate in bud, subequal, bases concave conniving, blade flat spreading. *Stamens* indefinite, long-cuneate, truncate; anther-cells linear, dorsal. *Ovaries* solitary or 2-6, on a concave torus; stigma large, grooved; ovules many. *Ripe carpels* berried.—Distrib. Tropical India and Malaya; species 8.

| | | | |
|---|---|---|---|
| Ripe carpels ovoid | ... | ... | ... 1 *C. virgatus.* |
| Ripe carpels globular | ... | ... | ... 2 *C. Maingayi.* |

In its petals this genus resembles *Artabotrys* to some extent, but *Polyalthia* still more. The ovaries in the first two species are usually solitary; in the third they are 3 in number: the ripe carpels of all three being large succulent and many-seeded. Baillon admits the genus as it was established by Champion and accepted by Hooker filius & Thomson. In the above diagnosis I have however modified the definition so as to provide for the species with more than one ovary.

1. Cyathocalyx virgatus, King. A tree 40 to 60 feet high: young branches slender, pale, glabrous, the tips alone pubescent. *Leaves* membranous, elliptic-oblong to oblong-lanceolate, shortly and obtusely acuminate, the base cuneate or sometimes rounded; both surfaces shining, the lower rather darker when dry; the upper glabrous, the lower pubescent on the 8 or 9 pairs of sub-ascending rather prominent nerves: length 4 to 6·5 in., breadth 1·25 to 2·75 in.; petiole ·25 to ·35 in., pubescent. *Flowers* in axillary, sub-sessile fascicles of 2 or 3, about ·75 in. long. *Sepals* united at the base, ovate to ovate-lanceolate, spreading, tomentose, shorter than the inner petals. *Petals* tomentose-sericeous; the outer row much longer than the inner, lanceolate, much acuminate,

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about, ·75 in. long.; inner row with orbicular concave base and much acuminate apex, ·5 in. long. Connective of *stamens* slightly produced at apex and obliquely truncate. *Ovaries* 4 to 6, hirsute; ovules many, 2-seriate; stigma thick, discoid, sessile; torus conic, truncate, pubescent. *Ripe carpels* solitary, or in pairs and divergent, oblong-ovoid, blunt at each end, minutely tomentose, 2 to 3 in. long, and 1 to 1·5 in. in diam.; pericarp thick; seeds 8 to 10, compressed, elongate and narrowly subreniform, transversely substriate. *Unona virgata*, Blume Bijdr. 14; Fl. Javæ Anon. 43 t. 19 and 25B.; Miq. Fl. Ind. Bat., I. Pt. 2, p. 42. *Meiogyne virgata*, Miq. Ann. Mus. Lugd. Bat. II., 12. *Cananga virgata*, Hook fil. and Thoms. Fl. Br. Ind. I, 57.

Malacca: Maingay (Kew Distrib.), No. 92. Perak; King's collection. Distrib. Java.

Blume describes the carpels as from 3 to 5; but I have never found more than two, and it is difficult to understand how more can come to perfection on the comparatively small torus. In Java this is said often to be a bush from 6 to 8 feet high: in Perak it is a tall tree.

2. Cyathocalyx Maingayi, Hook. fil. and Thoms. Fl. Br. Ind. I, 53. A tree 50 or 60 feet high: young branches rather stout, puberulous, speedily glabrous and dark-coloured. *Leaves* elliptic to oblong, thinly coriaceous, slightly obovate, shortly caudate-acuminate, the base rounded or slightly cuneate; upper surface shining, quite glabrous; the lower puberulous when young, ultimately glabrous; the main nerves 13 to 15 pairs, bold and prominent, spreading, interarching near the edge: length 5·8 to 8·8 in., breadth 2·75 to 3·75 in., petiole ·3 in. *Flowers* 2 to 3 in. in diam., solitary or in short, 2- to 3-flowered racemes, axillary or extra-axillary: pedicels ·5 to ·75 in. long with a large stem-clasping bracteole near the apex. *Sepals* spreading or sub-reflexed, ovate, sub-acute, slightly connate at the base, puberulous on both surfaces, ·4 in. long. *Petals* thinly coriaceous, subequal, puberulous, obovate or broadly obovate-lanceolate, blunt, the base with a short claw, pale greenish with a blotch of reddish yellow at the base, all (but especially the inner row) more or less convex, the inner row slightly concave and glabrous at the base inside. *Stamens* numerous, cuneate, short; the connective produced into a broad, flat, orbicular, oblique expansion which over-hangs the dorsal linear anthers. *Ovaries* 3, narrowly ovoid, pubescent, ovules about 10 in 2 rows: style short, lateral: stigma large, lobed, villous. *Ripe carpels* 1 or 2, globular, 1·5 to 1·75 in. in diam., slightly tubercular when dry and minutely pubescent. *Seeds* 10 in 2 rows, elongated, compressed.

Malacca: Maingay (Kew Distrib.), No. 94. Singapore: Ridley. Perak: King's Collector.

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This species is doubtfully referred to *Cyathocalyx* by its authors, and chiefly on the ground that the petals, although valvate at the base, are slightly imbricate above. An examination of the large number of specimens sent from Perak by the Calcutta Botanic Garden Collector enables me to state that in bud the petals are truly valvate, but that as they develope they undoubtedly overlap. The anthers, ovaries and and ripe fruit appear to me to be those of *Cyathocalyx;* and in habit and general appearance of its leaves this plant agrees with the other species above described. In addition to the species above described, there are, in the Calcutta Herbarium, fruiting specimens from Perak of a small tree which is apparently a fourth species of *Cyathocalyx.* The leaves of this are oblong-lanceolate to oblong-ovate, 8- to 10-nerved, glabrous above and puberulous beneath; and the ripe carpels are in pairs, ovoid, puberulous, about 1·5 in. long. None of the specimens has any trace of flower.

### 7. Artabotrys, R. Brown.

Sarmentose or scandent shrubs. *Leaves* shining. *Flowers* solitary or fascicled, generally on woody, usually hooked, recurved branches (peduncles). *Sepals* 3, valvate. *Petals* 6, 2-seriate, bases concave connivent; limb spreading, flat, sub-terete or clavate. *Stamens* oblong or cuneate; connective truncate or produced; anther-cells dorsal. *Torus* flat or convex. *Ovaries* few or many; style oblong or columnar; ovules 2, erect, collateral. *Ripe carpels* berried.—Distrib. Tropical Africa and Eastern Asia; described species about 32.

This genus is at once distinguished by the curious hooked flower-peduncles. The petals are thick and mostly narrow, concave and closely connivent at the base, while the limb is spreading. The habit of all is scandent. Besides those described below, there are in the Calcutta Herbarium imperfect materials of five undescribed species from Perak, and of one from the Andaman Islands.

Petals lanceolate to elliptic.

Flowers less than 1 in. long.

| | |
|---|---|
| Petals very fleshy, broadly elliptic, blunt | 1. *A. grandifolius.* |
| „ coriaceous, broadly lanceolate, acuminate ... ... ... | 2. *A. Scortechinii.* |
| „ slightly fleshy, elliptic-oblong, obtuse ... ... ... | 3. *A. pleurocarpus* |

Flowers about 1 in. long.

| | |
|---|---|
| Outer petals ovate-lanceolate; the inner lanceolate or linear ... ... | 4. *A. venustus.* |

Flowers more than 1 in. long.

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Leaves elliptic to oblong, obtuse or shortly and bluntly mucronate, coriaceous ... 5. *A. crassifolius.*
Leaves oblong, acuminate, coriaceous ... 6. *A. oblongus.*
Leaves oblong-lanceolate.
Leaves shortly caudate-acuminate, flower nearly 2 in. long ... 7. *A.-Lowianus.*
Leaves shortly acuminate; flower 1·5 to 1·75 in. long; ripe carpels narrowly elliptic, tapering to both ends, glabrous ... ... ... 8. *A. oxycarpus.*
Limb of petals linear, sub-triquetrous, cylindric, or sub-clavate.
Petals thickly coriaceous, linear, blunt, adpressed-pubescent ... ... 9. *A. speciosus.*
Petals linear-oblong, obtuse, (glabrous ?) 10. *A. Maingayi.*
Petals fleshy, the outer 3 flattened; the inner 3 obtusely triquetrous ... 11. *A. gracilis.*
Petals fleshy, the limb cylindric to clavate 12. *A suaveolens.*
Imperfectly known species ... ... 13. *A. costatus.*
* * * ... ... 14. *A. Wrayi.*

1. ARTABOTRYS GRANDIFOLIUS, n. sp. King. A powerful creeper 60 to 80 feet long; young branches stout, pale, striate, glabrous. *Leaves* thinly coriaceous, large, minutely pellucid-punctate, pale yellowish-green when dry, elliptic-oblong to elliptic-obovate; the apex broad, obtuse or abruptly sub-acute; the base cuneate: both surfaces glabrous, distinctly reticulate, the upper shining, the lower duller: main nerves 10 to 12 pairs, oblique, inter-arching boldly ·25 in. from the edge; length of blade 8 to 14 in., breadth 3 to 5 in.: petiole ·4 in., stout. *Petals* very fleshy, densely and minutely tomentose, unequal; the outer 3 broadly elliptic, sub-acute or blunt, slightly concave, ·75 in. long and ·4 in. broad: inner 3 obovoid, spreading but with incurved apices, slightly shorter than the outer. *Peduncles* (in fruit) nearly 3 in. long, stout: torus hemispheric, 1 in. in diam. *Ripe carpels* numerous, glabrous, lenticellate, elliptic-obovoid, the apex mammillate, narrowed at the base into a short stout pseudo-stalk nearly ·5 in. long; length of ripe carpel about 1·5 in., diam. 1 in.: pericarp hard, about ·1 in. thick. *Seed* solitary, narrowly ellipsoid, blunt, 1·1 in. long, and ·6 in. in. diam.; the testa pale, rugulose. *A. macrophyllus*, King MSS. (not of Hook. fil).

Perak; at Goping, elevation 500 to 800 feet, King's Collector, No. 4477; Scortechini No. 1068.

Some specimens of this were unfortunately distributed from the Calcutta Herbarium under the MSS. name of *A. macrophyllus*,—a name

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pre-occupied by an African species described by Sir J. D. Hooker (Niger Flora, 207).

2. Artabotrys Scortechinii, n. sp. King. A climber. All parts except the flower and possibly the fruit glabrous: young branches slender, dark-coloured. *Leaves* thinly coriaceous, ovate-lanceolate, shortly acuminate, the base cuneate; upper surface shining; the lower dull when young, very minutely scaly, afterwards glabrous; main nerves 9 to 11 pairs, spreading, inter-arching ·1 in. from the edge, slender but rather prominent beneath: length of blade 2·25 to 3·25 in., breadth ·9 to 1·3 in., petiole 2 in. *Peduncle* rather slender, 3-to 4-flowered; pedicels ·5 in. long, thickened upwards, puberulous, with a small ovate bracteole at the very base. *Flowers* ·6 to ·8 in. long. *Sepals* very coriaceous, triangular, acuminate, the apices slightly reflexed, conjoined at the base only, rugulose and adpressed-pubescent externally, ·25 in long. *Petals* coriaceous, broadly-lanceolate acuminate, tomentose on both surfaces, the inner three smaller than the outer 3. *Anthers* with broad connectival apical appendages. *Torus* rather flat, sericeous: ovaries glabrous. *Fruit* unknown.

Perak, Scortechini.

A species near *A. polygynus*, Miq., but with glabrous leaves and different flowers from that species.

3. Artabotrys pleurocarpus, Maingay in Hook. fil. Fl. Br. Ind. I, 54. A large climber; all parts except the flowers glabrous; young branches lenticellate, striate, dark-coloured. *Leaves* coriaceous, oblanceolate-oblong, the apex abruptly and shortly acuminate, the base much narrowed: both surfaces shining and reticulate, the upper paler; main nerves about 10 pairs, spreading, slender: length of blade 4 to 6·5 in., breadth 1·5 to 2·25 in.; petiole ·15 in., thick. *Peduncles* flat, stout, much hooked, bearing several ebracteolate pedicels, ·5 in. long, densely pubescent. *Flowers* 1·5 in. long. *Sepals* broadly ovate, obtuse. *Petals* subequal, flat, elliptic-oblong, obtuse, pubescent on both surfaces, the outer 1 to 1·35 in. long, the inner smaller. *Anthers* with apiculate connectives. *Ovaries* many, slender. *Ripe carpels* broadly elliptic, mammillate, obscurely grooved, narrowed into the short stout stalk, ·75 in. long. *Seeds* 2, with hard testa.

Malacca; Maingay. Perak, Scortechini, No. 331.

4. Artabotrys venustus, n. sp., King. A large climber, 30 to 80 feet long; young branches at first puberulous, afterwards glabrous, dark coloured, striate. *Leaves* coriaceous, elliptic to elliptic-oblong, abruptly and shortly acuminate, the base rounded or very slightly narrowed: both surfaces glabrous, the upper shining, the lower dull, adult leaves pale brown (when dry): main nerves 7 to 10 pairs, spreading

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or sub-ascending, curved, inter-arching freely ·1 to ·2 in. from the edge, prominent on the lower, less so on the upper, surface; length of blade 3·5 to 6 in., breadth 2 to 3 in., petiole ·2 to ·25 in. *Peduncles* extra-axillary, rather slender in flower, (stout in fruit), minutely tomentose, bearing 3 or 4 flowers, ·75 to 1 in. long.; pedicels slender, pubescent or glabrescent., from ·5 to 1 in. long, ebracteate. *Sepals* coriaceous, broadly triangular, sub-acute, slightly conjoined at the base, sub-reflexed, puberulous externally, glabrous within, ·15 in. long. *Petals* coriaceous, minutely tomentose, subequal; the outer 3 with small claw, glabrous inside, ovate-lanceolate sub-acute; the inner 3 shorter than the outer, lanceolate or linear. *Anthers* short, slightly compressed; the apex orbicular, flat. *Ovaries* about 10, oblong, granular. *Carpels* about 6, sessile, narrowly obovoid, apiculate, slightly narrowed to the base, at first puberulous, ultimately glabrous, 1·5 in long and ·8 in. in diam.; pericarp thin. *Seeds* 2, oblong, plano-convex, about 1 in. long and ·6 in. broad, smooth.

Perak; at elevations up to 1,000 feet, King's Collector, Nos. 3725, 4392, 6499, 6968, King's Collector.

5. ARTABOTRYS CRASSIFOLIUS, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 54. A large climber; young branches minutely rusty-tomentose. *Leaves* very coriaceous when adult, elliptic to oblong, obtuse or shortly and bluntly mucronate, the base acute or rounded: upper surface glabrous, shining: the lower dull, paler in colour when young, sparsely adpressed-pilose, afterwards glabrous; main nerves 9 or 10 pairs, oblique, when dry faintly impressed on the upper and slightly prominent on the lower surface; length of blade 6 to 6·5 in., breadth 1·75 to 2·75 in.; petiole ·3 to ·4 in., stout. *Peduncles* flat, much hooked, stout: each with several stout rusty-tomentose pedicels ·3 to ·4 in. long; bracts few, ovate. *Flowers* 1·25 in. long. *Sepals* ovate-lanceolate, sub-obtuse, softly rusty-pubescent outside, pubescent within. *Petals* coriaceous, oblong-lanceolate, sub-ovate, densely tomentose on both surfaces; the inner 3 smaller than the outer 3. *Fruiting pedicel* very stout; the torus sub-globose. *Ripe carpels* about 8, sessile, sub-obovoid to ovoid, glabrous, slightly rugose, 1·25 to 1·65 in. long and ·75 to 1·15 in. in diam.; pericarp thick, pulpy. *Seeds* 2, collateral, oblong, compressed, grooved along the edge, ·9 in. long and ·6 in. broad. Kurz For. Flora Burma, I, 30.

Burmah; Martaban, King, Brandis. Perak; King's Collector, No. 8384.

6. ARTABOTRYS OBLONGUS, n. sp., King. A climber 50 to 70 feet long, ultimately all parts except the inflorescence glabrous; young branches slender, rufous-pubescent; the bark dark-coloured when very young, afterwards rather pale, striate. *Leaves* when adult coriaceous, oblong, shortly acuminate, the base acute, when adult both surfaces



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glabrous, the upper shining, the lower dull and when young sparsely pubescent along the midrib; main nerves 10 to 12 pairs, inconspicuous on the upper, slightly prominent in the lower surface, spreading, forming 2 or 3 series of arches within the margin; length of blade 6·5 to 9 in., breadth 2·5 to 3 in., petiole ·4 in. *Peduncles* stout, pubescent when young, bearing 3 or 4 pedicels; flowers 1·35 in. long; pedicels about 1 in., pubescent, slightly thickened upwards. *Sepals* coriaceous, triangular, acute, concave, spreading rufous-pilose on both surfaces, slightly conjoined at the base, ·25 in. long. *Petals* coriaceous, the portion above the saccate base lanceolate, subacute, strigosely tomentose on both surfaces, the claw partly glabrous and partly covered with minute white hair. *Anthers* compressed, with oblong, obliquely truncate, flattened heads. *Ovaries* few, oblong, glabrous; the stigma broad, oblique. *Fruit* unknown.

Perak; King's Collector, No. 6524.

7. Artabotrys Lowianus, n. sp., Scortechini MSS. A stout climber; all parts except the flowers glabrous; young branches slender, dark-coloured. *Leaves* thinly coriaceous, oblong-lanceolate, shortly caudate-acuminate, the base cuneate: both surfaces shining, minutely reticulate; main nerves 8 to 10 pairs, spreading, inter-arching ·2 in. from the margin, faint; length of blade 3·5 to 6 in., breadth 1·25 to 1·75 in., petiole ·25 in. *Peduncles* extra-axillary, 2- to 3-flowered, glabrous; pedicels thickened upwards, ·5 to 75 in. long, glabrous. *Sepals* triangular, acute, glabrous, ·25 in. long, enlarging a little with the fruit. *Petals* fleshy, adpressed-puberulous, elliptic-lanceolate above the concave base, obtuse; the outer three 1·75 in. long, the inner three smaller. *Anthers* with a rounded apical process from the connective. *Ovaries* many, glabrous. *Carpels* (quite young) sessile, ovoid, apiculate; ripe carpels unknown.

Perak; Scortechini; No. 2012.

This species is near *A. pleurogynus*, Miq, but is perfectly glabrous, not sub-strigose pubescent; its ripe fruit is unknown.

8. Artabotrys oxycarpus, n. sp., King. A stout climber, 60 to 80 feet long; all parts except the flower glabrous; young branches slender, black when dry. *Leaves* oblong-lanceolate, shortly acuminate, the base cuneate, both surfaces shining, reticulate; main nerves 6 to 8 pairs, spreading, slender; length of blade 3 to 5·5 in., breadth 1·25 to 1·5 in. *Peduncles* short (·75 in. long), glabrous, bearing about 2 minutely bracteolate pedicels ·75 in. long. *Flowers* 1·5 to 1·75 in. long. *Sepals* coriaceous, small, broadly ovate, acute, ·2 in. long, conjoined at the base, spreading. *Petals* coriaceous, very much longer than the sepals, lanceolate, obtuse; the inner 3 smaller; all adpressed-pubescent, and the

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saccate base small in all. *Torus* small, sericeous. *Ovaries* glabrous. *Ripe carpels* numerous, sessile, glabrous, narrowly elliptic, tapering to each end, the apex caudate, 1 to 1·2 in. long and ·4 in. in diam.; pericarp thin. *Seeds* 2, plano-convex, compressed, blunt, ·25 in. long.

Perak; King's Collector, Nos. 5150 and 5605; Wray No. 3286.

This species comes near the Bornean *A. polygynus*, Miq. (Ann. Mus. Lugd. Bat. II, 4). But this species has more pointed and perfectly smooth ripe carpels; while those of *A. polygynus* are more ovoid, with shorter terminal point and have many vertical ridges. *A. polygynus* moreover is sub-strigosely pubescent, this is glabrous.

9. Artabotrys speciosus, Kurz in Hook. fil. Fl. Br. Ind. I, 55. A large climber: young branches slender, dark-coloured, sparsely adpressed-pilose, afterwards glabrous. *Leaves* coriaceous, oblong or oblong-lanceolate, rarely oblanceolate, shortly and obtusely acuminate, the base acute; both surfaces glabrous, shining: main nerves 7 to 10 pairs, spreading, inter-arching at some distance from the edge, slender: length of blade 6 to 8 in., breadth 2 to 2·5 in., petiole ·25 in. *Peduncles* extra-axillary, flattened, short and not much hooked, puberulous, each bearing several short puberulous 1-flowered ebracteolate flower-pedicels: flowers from 1·25 to nearly 2 in. long, yellow. *Sepals* ·2 in. long, broadly ovate, acute, pubescent outside, glabrous inside. *Petals* thickly coriaceous, adpressed-pubescent, linear above the concave base, rather blunt; the inner smaller than the outer; torus pilose: fruit unknown. Kurz For. Flora, Burm. I, 32.

Andaman Islands; along Middle Straits, Kurz. S. Andaman; at Caddellgunge, King's Collector.

10. Artabotrys Maingayi, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 55. A powerful creeper, 40 to 80 feet long: all parts glabrous except the flowers; the young branches slender, dark-coloured. *Leaves* thin, elliptic, acuminate at base and apex: both surfaces shining, finely reticulate: main nerves 7 to 9 pairs, spreading, faint: length of blade 3·5 to 6 in., breadth 1·35 to 2 in., petiole ·25 to ·5 in. *Peduncles* flat, much curved, glabrous. *Flowers* 1 in. in diam., fascicled, peduncle ·5 to 1·5 in., hoary-pubescent. *Sepals* small, obtuse, ·2 in. long. *Petals:* the outer linear-oblong, obtuse, concave the saccate base small and sub-orbicular, 1 to 1·25 in. long and ·25 to ·35 broad; the inner smaller and narrower and much curved. *Ovaries* 3 or 4 ovoid, glabrous. *Ripe carpels* sessile, elliptic-globose, mammillate, yellow, glabrous, when ripe 2·5 in., long and 1·5 in. in diam. *Seeds* 2, plano-convex, testa stony.

Malacca; Maingay.

11. Artabotrys gracilis, n sp. King. A slender woody climber, 60 to 80 feet long: young branches dark-coloured: all parts quite

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glabrous except the petals. *Leaves* thinly coriaceous, ovate-lanceolate, shortly acuminate, the base cuneate; both surfaces glabrous and shining, the upper when dry tinged with green: main nerves 7 or 8 pairs, spreading, inter-arching inside the edge, very faint on both surfaces, reticulations rather distinct: length of blade 2·5 to 3 in., breadth 1 to 1·75 in., petiole ·15 to ·2 in. *Peduncles* extra-axillary, short, much hooked, glabrous, usually 4- to 6-flowered; pedicels ·35 in. long, thickened upwards, ebracteolate, glabrous: flower ·3 to ·4 in. long. *Sepals* very coriaceous, semi-orbicular, slightly pointed at the apex, very little conjoined at the base, concave, spreading *Petals* fleshy, sub-equal, curved, spreading, densely tomentose, the outer 3 flattened; the inner obtusely 3-angled, tumid at the base, smaller than the outer 3. *Anthers* with broad apical connectival processes. *Ovaries* 3 or 4, oblong, with large discoid lobed stigmas, torus villous. *Ripe carpels* 3 or 4, sessile, obovoid, with several vertical ridges, the base contracted, glabrous, ·8 in. long and ·7 in. in diam. *Seeds* 2, compressed-ovoid, obtuse at each end, shining.

Perak: at low elevations, King's Collector, Nos. 3746, 4987 and 7543.

Allied to *A. suaveolens*, Bl.; but with differently shaped petals, pistils and carpels.

12. Artabotrys suaveolens, Blume Fl. Javae Anon. 62, t. 30, 31D. A climber 20 to 30 feet long; the petals always tomentose, the other parts mostly glabrous, but sometimes the young branches, peduncles, and under surfaces of the midribs of the leaves adpressed-puberulous. *Leaves* thinly coriaceous, oblong-lanceolate to ovate-lanceolate, acute or shortly acuminate, the base acute; both surfaces shining, the reticulations rather distinct, the upper often deeply tinged with green when dry. *Peduncles* extra-axillary, thin at first, but becoming stout and flat with age, glabrous or puberulous, bearing from 5 to 15 flowers; pedicels ·3 to ·45 in. long, thickened upwards, sparsely adpressed-pubescent, with a small narrowly ovate bract at the base; flowers about ·4 in. long. *Sepals* broadly ovate, the apex pointed, thinly coriaceous, sparsely adpressed-pubescent externally, very slightly conjoined at the base, spreading, ·1 in. long. *Petals* fleshy, adpressed-tomentose, dilated and thin at the base, the limb cylindric to clavate, sub-erect, slightly spreading, sometimes with the apex incurved. *Anthers* short, with a very broad oblique flattened apical appendage from the connective; torus slightly pubescent. *Ovaries* broadly ovoid, sub-compressed, the stigma small. *Ripe carpels* few, ellipsoid, the apex blunt, the base slightly contracted, smooth, glabrous, ·4 to ·5 in. long and ·25 in. in diam.; pericarp thin, fleshy. *Seed* single, ellipsoid, blunt at each end, the testa granular. Wall. Cat. 6416; H. f. & T.

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Fl. Ind., 129; Hook. fil. Fl. Br. Ind. I, 55; Miq. Fl. Ind. Bat. I. Pt. 2, 39 Ann. Mus. Lugd. Bat. II, 43; Kurz For. Fl. Burm. I; *Artabotrys parviflora*, Miq. Fl. Ind. Bat. Supp., 375. *Unona suaveolens*, Blume Bijdr. 17.

In all the Malayan Provinces at low elevations: common. Sylhet to Malacca in British India.

This species varies somewhat as to size of flowers and texture of leaf. The form named *A. parviflora* by Miq. in his Sumatra Supplement was, by himself, subsequently reduced to a variety of this species (Ann. Mus. Lugd. Bat. II, 38).

13. Artabotrys costatus, n. sp. King. A climber from 15 to 80 feet long: young branches slender, dark-coloured, scantily tawny-puberulous when young, afterwards glabrous. *Leaves* thinly coriaceous, elliptic-oblong, slightly oblanceolate, abruptly and shortly acuminate, the base cuneate; upper surface shining, glabrous except the lower part of the midrib which is tomentose; lower surface paler, dull, sparsely puberulous towards the base when young, afterwards glabrous; main nerves 12 to 14 pairs, spreading, forming one series of very bold arches ·3 in. from the margin, with a series of smaller arches outside it, very stout and prominent on the lower, slightly so on the upper, surface, reticulations distinct on both: length of blade 7 to 9 in., breadth 2·5 to 3·25 in., petiole ·2 in. *Peduncles* rather small, much hooked. *Flowers* unknown. *Carpels* (*unripe*) 2 to 5, sessile, ellipsoid, blunt at each end, about 1 in. long and ·6 in. in diam, (unripe), glabrous: pericarp thin; seeds 2, elliptic.

Perak; on Ulu Bubong at elevations of from 500 to 800 feet, King's Collector, Nos. 4291 and 10184.

I have ventured to describe this although its flowers are unknown, and the only fruit collected is unripe. By its oblong costate leaves it differs from every other described *Artabotrys* except *A. macrophyllus*, mihi.

14. Artabotrys Wrayi, King. A climber: young branches rather stout, softly pale rusty-tomentose; ultimately glabrous pale and furrowed. *Leaves* thinly coriaceous, large, oblong-elliptic to elliptic, shortly acuminate, the base rounded; both surfaces boldly reticulate; the upper glabrous and shining, sub-bullate when dry; the lower shortly and rather softly cinereous-pubescent; main nerves 10 to 12 pairs, oblique, curving, inter-arching freely within the edge, depressed above and bold and prominent beneath like the midrib; length 8 to 11 in., breadth 2·75 to 5 in., petiole ·35 in., stout, tomentose when young, glabrescent when old. *Peduncles* extra-axillary, rather short, very thick in fruit, sometimes straight when young and curving only when in fruit, few-flowered, glabrous; pedicels 1 in. long, stout, softly tawny-tomentose with several

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bracteoles at the base. *Flowers* 1 in. long. *Sepals* broadly ovate at the base, tapering rapidly upwards, acuminate, about ·5 in. long, densely sericeous-tomentose outside, sub-glabrous inside especially at the base. *Petals* thick, sub-equal, ovate-oblong, sub-acute, slightly contracted above the claw, softly adpressed-sericeous except on the glabrous concavity of the claw inside. *Ovaries* numerous. *Ripe carpels* obovoid, tapering much to the base, the apex mucronate, densely tawny-tomentose, sessile; nearly 1 in long.

Perak; Wray, King's Collector.

Next to *A. grandifolius*, this has the largest leaves of any of the Asiatic species of the genus, but from that species it differs in having them pubescent beneath. Only a single flower has hitherto been collected.

### 8. Drepananthus, Maingay MSS.

Trees. *Leaves* large, pubescent beneath. *Racemes* very short, fascicled on woody truncal tubercles. *Sepals* 3, nearly free. *Petals* 6, valvate, 2-seriate, subequal; bases concave, connivent; limb erect or spreading, broad or narrow. *Stamens* many, cuneate, truncate; anthers linear, cells lateral; connective very slightly produced. *Ovaries* 4–12; stigma sub-sessile; ovules 4 or more, 2-seriate. *Ripe carpels* globose, several-seeded. Two species.

This genus differs from *Artabotrys* in its members being trees, not climbers; and in having 4 or more ovules in its ovaries. Dr. Scheffer (Ann. Jard. Bot. Buitenzorg II, 6) proposed to make it a section of *Cyathocalyx*.

Petals of both rows with more or less ovate limb 1. *D. pruniferus*.
" " with narrowly cylindric limb 2. *D. ramuliflorus*.

1. Drepananthus pruniferus, Maing. in Hook. fil. Fl. Br. Ind. I, 56. A tree 40 to 50 feet high; branches stout, rufous-pubescent at first, finally glabrescent. *Leaves* coriaceous, elliptic to elliptic-oblong, acute or obtuse, the base rounded or sub-cordate, often unequal; upper surface glabrous, except the depressed tomentose midrib and main nerves; lower surface shortly rufous-pubescent when young, glabrescent when adult; main nerves 14 to 16 pairs, prominent beneath; intermediate nerves stout, parallel, oblique; length 7·5 to 14 in., breadth 3 to 6·5 in.; petiole ·5 to 1·5 in. stout, channelled. *Racemes* 6- to 8-flowered, crowded; flowers ·75 in. long, their pedicels rufous-tomentose, ·5 to ·75 in. long, each with a large oblanceolate bract. *Sepals* and *petals* subequal, very coriaceous, densely covered (except the inside of the claws of the petals) with a layer of minute whitish tomentum; sepals united by their base, ovate-oblong, spreading; petals of outer row broadly ovate,

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sub-acute, slightly constricted above the claw; those of the inner row closely connivent, much constricted above the claw, their apices broad and emarginate. *Ovaries* oblong, sericeous-tomentose. *Ripe carpels* 6 to 8, sessile, sub-globose, minutely pubescent to glabrescent, 1 to 1·25 in. in diam. *Seeds* numerous, oblong, flat, shining.

Malacca: Maingay (Kew Distrib.) No. 90. Perak; King's Collector, Scortechini. Penang, Curtis No. 1417.

2. Drepananthus ramuliflorus, Maing. Hook. fil. Fl. Br. Ind. I, 56. A tall tree, the young branches as in *D. pruniferus*. *Leaves* as in *D. pruniferus*, but slightly broader at the apex and narrowed at the base. *Flowers* ·4 to ·5 in long, much crowded in very short fascicles from tubercles on the branches below the leaves: pedicels about ·3 in. long stout, rufous-tomentose as is the single sub-orbicular bracteole. *Sepals* much shorter than the petals, broadly triangular, acuminate, spreading, rufous-tomentose especially outside. *Petals* with concave, connivent, tomentose claw and fleshy, sub-cylindric, spreading, much curved, adpressed-pubescent limbs. *Ovaries* about 5, sessile, oblong. *Carpels* (young) ovoid, slightly oblique, densely rufous-tomentose; walls of pericarp very thick: seeds few: ripe fruit unknown.

Malacca: Maingay (Kew Distrib.), No. 91. Distrib. Sumatra; Forbes, No. 2913.

9. Canangium, Baill. (*Cananga*, Rumph.)

Tall trees. *Leaves* large. *Flowers* large, yellow, solitary or fascicled on short axillary peduncles. *Sepals* 3, ovate or triangular, valvate. *Petals* 6, 2-seriate, subequal or inner smaller, long, flat, valvate. *Stamens* linear, anther-cells approximate, extrorse; connective produced into a lanceolate acute process. *Ovaries* many; style oblong (or 0 ?); stigmas sub-capitate; ovules numerous, 2-seriate. *Ripe carpels* many, berried, stalked or sessile. *Seeds* many, testa crustaceous, pitted, sending spinous processes into the albumen.—Two species.

The tree known as *Cananga odorata* H. f. and T. was by Rumphius (who wrote an account of it in Herb. Amb. II, 195, published in 1750) named *Cananga* (Latinice) and *Bonga Cananga* (Malaice). Rumphius' description is of the usual pre-Linnæan sort, there being no differentiation of generic and specific characters and his name of course is not binomial. In the chapter of his book following that in which *Cananga* proper is treated of (*l. c.* p. 197), Rumphius proceeds to describe the wild *Canangas* as distinguished from the *Cananga* proper, which was in his time, (as it is still) much cultivated by the Malays on account of the fragrance of its flowers. These wild *Canangas* Rumphius calls *Canangæ sylvestres* and of them he distinguishes three sorts.

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1. *Cananga sylvestris prima sive trifoliata* (Malaice *Oetan*).
2. *Cananga sylvestris secunda sive angustifolia.*
3. *Cananga sylvestris tertia sive latifolia.*

Of the first two Rumphius gives figures on t. 66 of the same volume; and judging from these figures, the plants fall into the modern genus *Polyalthia.*

Linnæus' Species Plantarum was published in 1753, therefore Rumphius' names are in point of time, as they are in point of form, pre-Linnæan. Linnæus does not accept *Cananga* as a genus and he refers to the *Cananga* of Rumphius only in a note under *Uvaria Zeylanica.* And the first botanists to adopt the *Cananga* of Rumphius as a genus are Hook. fil. and Thomson (in Fl. Ind. 130). But in 1775 Aublet (in his *Histoire des Plantes de la Guiane Francaise,*) published, in regular Linnæan fashion, the genus *Cananga* for the reception of a single species named *C. ouregou* of which he gave a figure (t. 244). Nineteen years later (1794) Ruiz and Pavon, (in their *Prodromus Floræ Peruvianæ et Chilensis,*) published under the name of *Guatteria* a genus with exactly the same characters as Aublet's *Cananga.* Unless therefore Hook f. and Thomson are right in making a special case in establishing, as a genus in the Linnæan sense, the *Cananga* of Rumphius, Aublet's genus *Cananga* must stand, and to it must be relegated all the American species referred to Ruiz and Pavon's genus *Guatteria.* Authorities vary in their treatment of the *Cananga* of Rumphius. Dunal (in his *Monographie de la famille des Anonacees*) pronounces for the suppression of Aublet's *Cananga* in favour of that of Rumphius who, he incorrectly says, assigned *two* species to it; the fact being as already shown, that Rumphius divided *Cananga* into (*a*) cultivated (with one sort) and (*b*) wild (*sylvestres*) with three sorts. Dunal (and I think wrongly) refers all the *Cananga* of Rumphius to *Unona.* In their Genera Plantarum, Mr. Bentham and Sir J. D. Hooker retain the *Cananga* of Rumphius and reduce *Cananga* of Aublet to *Guatteria.* Baillon, on the other hand, retains the *Cananga* of Aublet as a genus, and to it refers all the S. American species of *Guatteria.* He reduces *Cananga odorata* H. f. and Th. to *Unona* and, altering the termination of its generic name, he makes it a section of *Unona* under the sectional title of *Canangium.*

The grounds for separating *Cananga* from *Unona* as a genus are thus stated by the authors of the Flora Indica. "In habit and general appearance this genus closely resembles *Unona*; but the indefinite ovules prevent its being referred to that genus. The peculiar stamen (with a long conical apical point) and the seeds are themselves, we think, sufficient to justify us in distinguishing it as a genus." The simplest solution of the synonymic knot, and one for which there is some justi-

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fication on the ground of structure, appears to lie in the acceptance of Baillon's suggested name, giving up that of the authors of the Flora Indica.

The synonymy of *Guatteria* is further complicated by the fact that a large number of species with valvate æstivation were referred to it by Wallich and others. These, however, were separated by Hook fil. and Thoms. by whom the genus *Polyalthia* was formed for their reception. Sir Joseph Hooker refers to *Cananga*, not only the species *C. odorata*, but another named *C. virgata*. The latter plant appears to me, in the light of full material recently received, to be a typical *Cyathocalyx*, and to that genus I have ventured to remove it. A third species doubtfully referred to the genus *Cananga* under the specific name *monosperma*, appears to me from the description (I have seen no good specimen) to be so doubtful that I exclude it altogether. The seeds both of this species and of *C. Odoratum* are peculiar; I quote the following excellent description of those of *C. odoratum* from Hooker fil. and Thomson's Flora Indica, page 130. "The seeds are pitted like those of the section *Kentia* of *Melodorum*, and of some *Cucurbitaceæ*; and the inner surface of the brownish-yellow, brittle testa is covered with sharp tubercles, which penetrate into the albumen, taking the place of the flat plates which are found in the rest of the order."

| | | | |
|---|---|---|---|
| Flowers 2 or 3 in. long | ... | ... | 1 *C. odoratum.* |
| „ 1 to 1·25 in. long | ... | ... | 2 *C. Scortechinii.* |

1. CANANGIUM ODORATUM, Baill. Hist. des Plantes, I, 213 (*in note*). A tree 30 to 60 feet high; young branches rather slender, sub-striate, at first puberulous, slightly lenticellate, dark ashy-coloured when dry. *Leaves* membranous, ovate-oblong or oblong-lanceolate, sometimes broadly elliptic, acute, shortly acuminate or sub-obtuse; the base rounded or sub-cuneate, unequal; quite glabrous, the midrib and nerves puberulous; main nerves about 8 pairs, ascending, rather straight and slender: length 3·5 to 8 in., breadth 1·75 to 3 in., petiole ·5 in. *Flowers* 2 to 3 in. long, drooping, in 2- to 3-flowered shortly pedunculate racemes: pedicels slender, 1·5 to 2 in. long, recurved, puberulous, with one median and several basal, small, often deciduous bracts. *Sepals* free or joined at the base only, about ·35 in. long, triangular, tapering to a blunt point, reflexed. *Petals* linear-lanceolate, 3 to 3·25 in. long and ·3 in. wide, adpressed-sericeous when young. *Ovaries* sessile, narrowly oblong: stigma hemispheric. *Ripe carpels* from 10 to 12, pedicellate, oblong-obovoid, glabrous, blunt, ·65 to ·9 in. long, nearly black when ripe, pulpy: stalks from ·5 to ·75 in. long. *Seeds* 6 to 12, flattened, sub-ovate. *Cananga odorata*, H. f. and Th. Fl. Ind. 130; Fl. Br. Ind. I, 56; Miq. Fl. Ind. Bat. I, Pt. 2, 40. Kurz For. Fl. Burm. I, 3. *Uvaria odorata*,



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Lamb. Ill t. 495, f. 1; Roxb. Fl. Ind. ii. 661; Wall. Cat. 6457; W. & A. Prodr. 8; Blume Bijdr. 14, Fl. Jav. Anon. t. 9. Pierre Flore For. Coch. Chine, Anon. t. 18; Griff. Notul. iv. 712. *U. fracta*, Wall. Cat. 6460. *U. axillaris*, Roxb. Fl. Ind. ii. 667. *Unona odorata* and *U. leptopetala*, Dunal Anon. 108 and 114; *DC.* Prodr. i. 90 and 91; Deless. Ic. Sel. t. 88.

In all the provinces, planted. Indigenous in Tenasserim, Java, and the Philippines.

2. Canangium Scortechinii, King n. sp. A tree 30 to 40 feet high: young branches puberulous but speedily glabrous, dark-coloured and lenticellate. *Leaves* membranous, broadly ovate, sub-acuminate, the base broad rounded, slightly oblique; both surfaces pubescent when very young, ultimately glabrescent, the midrib and 6 or 7 pairs of nerves adpressed-pubescent, glandular-dotted; length 2·5 in., breadth 1·5 in. (fide Scortechini; length 3 to 7 in., breadth 2 to 3 in.) *Cymes* short, from the axils of leaves or of fallen leaves, few-flowered, shortly pedunculate. *Flowers* 1 to 1·25 in. long; pedicels under 1 in., pale-pubescent with a narrow, ovate, obtuse, mesial bracteole ·25 in. long. *Sepals* ovate, subacute, recurved, minutely yellowish-pubescent, ·35 in. long. *Petals* subequal, linear-obtuse, 1·25 in. long; the claw short, thickened, pubescent on both surfaces like the sepals. *Stamens* numerous; the connective with an apical process, bulbous at the base, suddenly tapering into a sharp point. *Ovaries* numerous, oblong, glabrous except at the pubescent base, with 6 or 8 ovules in two rows; stigma sessile, truncate. *Ripe carpels* unknown.

Perak: Scortechini.

Scortechini's specimens are in bud only and none of them has any fruit. The foregoing description has been prepared partly from his notes and partly from his specimens. The species differs from *C. odoratum* in having smaller leaves, a different inflorescence, with smaller, quite inodorous, flowers. It is also a smaller tree.

*Doubtful Species.*

*Cananga? monosperma* H. f. and Th. Fl. Br. Ind. I, 57. Of this I have seen only leaf-specimens.

10. Unona, Linn.

Trees or shrubs, erect or climbing. *Flowers* often solitary, axillary terminal or leaf-opposed. *Sepals* 3, valvate. *Petals* 6, valvate or open in æstivation, 2-seriate; 3 inner sometimes absent. *Torus* flat or slightly concave. *Stamens* cuneate; anther-cells linear, extrorse, top of connective sub-globose or truncate. *Ovaries* numerous; style ovoid or oblong, recurved, grooved; ovules 2–8, 1-seriate (rarely sub-2-seriate). *Ripe*

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*carpels* many, elongate and constricted between the seeds or baccate. *Seeds* few or many.—DISTRIB. Tropical Asia and Africa; species about 50.

Sect. I. DESMOS, H. f. and T. Petals 6, in two rows, ripe carpels jointed.

- Flowers solitary and always axillary: leaves elliptic-oblong to oblong-lanceolate ... 1. *U. Dunalii.*
- Flowers solitary, and extra-axillary, terminal or leaf-opposed.
  - Flower-peduncles 4 to 6 in. long, slender 2. *U. Desmos.*
  - Flower-peduncles 1 to 2 in. long.
    - Lower surfaces of leaves glaucous; petals glabrous or at most sparsely adpressed-sericeous ... ... 3. *U. discolor.*
  - Flower-peduncles from ·5 to 1 in. long.
    - Leaves more or less oblong or ovate or lanceolate, rufous-pubescent or tomentose beneath ... ... 4. *U. dumosa.*

Sect. II. DASYMASCHALON. Petals 3, or sometimes only 2: the inner row always absent; ripe carpels jointed.

- Flowers 3·5 to 6 in. long; petals linear-lanceolate, caudate-acuminate, not constricted between claw and limb ... ... 5. *U. longiflora.*
- Flowers 1·5 to 3·5 in. long; petals from ovate to lanceolate, more or less constricted above the claw ... ... ... 6. *U. Dasymaschala*

Sect. III. STENOPETALON. Petals 6 in two rows, usually very narrow: carpels baccate, not jointed.

- Flowers solitary ... ... ... 7. *U. Wrayi.*
- Flowers in fascicles from the larger branches or stem.
  - Petals linear-oblong, 1 to 1·5 in. long; ripe carpels globose, glabrous, their stalks 1 to 1·5 in. long ... ... ... 8. *U. desmantha.*
  - Petals narrowly linear, 3 to 3·5 in. long: ripe carpels globose, densely rufous-velvetty, shortly stalked ... ... 9. *U. crinita.*
  - Petals narrowly linear, 1·25 to 3 in. long: ripe carpels sub-globular or bluntly ovate, softly tomentose, ultimately sub-glabrous, sub-sessile ... ... ... 10. *U. stenopetala.*

1. UNONA DUNALII, Wall. Cat. 6425. A climber 60 to 100 feet long; young branches slender, rather pale, sub-rugose, lenticellate, glabrous. *Leaves* thickly membranous, pale when dry, elliptic-oblong

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to oblong-lanceolate, acute or shortly acuminate, the base rounded, the upper surface glabrous, shining, the lower slightly glaucous, sometimes with a few scattered hairs on the midrib; main nerves 10 to 12 pairs, spreading, not prominent; length 3 to 4 in., breadth 1·2 to 1·75 in., petiole ·2 in. *Flowers* axillary, solitary, 1·25 to 1·4 in. long; pedicels ·35 to ·5 in long, slender, pubescent, with a minute bracteole about the middle. *Sepals* broadly ovate, acute, puberulous, reflexed, ·25 to ·3 in. long. *Petals* narrowly oblong-lanceolate, sub-acute, puberulous to glabrous, 1 to 1·25 in. long, the inner row smaller. *Ripe carpels* numerous, stalked, glabrous, constricted between the 3 to 5 ovoid joints, 1·25 to 1·75 in. long; the stalks about 1 inch. Hook. fil. and Th. Fl. Ind. 131, (excl. the Concan plant); Miq. Fl. Ind. Bat., I. Ft. 2, 41; Hook. fil. Fl. Br. Ind. I, 58.

Penang; Wallich. Perak; King's Collector.

2. Unona Desmos, Dunal Anon., 112. A spreading shrub, often climbing; young branches slender, striate, adpressed, rufous-pubescent, often lanceolate. *Leaves* thinly coriaceous, oblong, acute or acuminate, the base rounded; upper surface glabrous or nearly so, the midrib sparsely pubescent; under-surface paler in colour, puberulous or pubescent; main nerves 12 to 14 pairs, spreading, rather prominent beneath; length 4·8 to 8·8 in., breadth 1·65 to 3·25 in., petiole ·35 in. *Flowers* solitary, extra-axillary, 1·35 to 1·75 in. long; peduncle slender, 4 to 6 in. long, glabrous; bracts few, lanceolate, minute, deciduous. *Sepals* ovate-acuminate, spreading, adpressed-pubescent, ·3 in. long. *Petals* coriaceous, ovate-lanceolate, adpressed-pubescent, nerved; the outer 2 in. long by about ·85 in. broad; the inner smaller. *Ripe carpels* numerous, stalked, ·5 to ·75 in. long, glabrous, constricted between the 2 to 3 oval joints. H. f. and T. Fl. Ind. 134; Miq. Fl. Ind. Bat. I, Pt. 2, 42: Hook. fil. Fl. Br. Ind. I, 59; Kurz For. Fl. Burm. I 34. *U. cochin-chinensis A. DC* Prod. I, 91; *U. pedunculosa, A. DC* Mem. Anon 28; *U. pedunculosa* Wall. Cat. 6422. *U. fulva*, Wall. Cat. 6427. *Desmos cochin-chinensis* Lour. Fl. Coch. Ch. I, 352. *U. discolor*, Wall. (not of Roxb.) Cat. 6420 D and E.

From Assam to Singapore. Distrib. Cochin-China.

3. Unona discolor, Vahl Symb. II, 63, t. 36. A spreading shrub, often also climbing; young branches slender, sub-rugose, pubescent towards the tips. *Leaves* membranous, oblong or oblong-lanceolate, acute, the base rounded; upper surface glabrous, shining; the lower glaucous, glabrous or pubescent; main nerves 8 to 10 pairs, sub-ascending, slightly prominent beneath; length 3 to 7·5 in., breadth 1 to 2 in., petiole about ·25 in. *Flowers* solitary, extra-axillary, 2 to 2·5 in. long; peduncles 1 to 2 in. long, rather slender, pubescent, with a minute linear

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bracteole below the middle, thickening when in fruit and lenticellate. *Sepals* ovate-lanceolate, spreading, nearly glabrous, ·4 to ·6 in. long. *Petals* coriaceous, narrowly lanceolate, 2 to 2·5 in. long, glabrous or sparsely adpressed-sericeous. *Ovaries* oblong, hairy. *Stigma* laterally grooved. *Ripe carpels* numerous, stalked, ·75 to 1·5 in. long, glabrous or pubescent, the constrictions between the 2 to 5 oval joints pubescent; stalks ·25 in. long. Dunal Anon. 111; DC. Prodr. i. 91; Wall. Cat. 6420 (*partly*); Roxb. Fl. Ind. ii. 669; W. & A. Prodr. 9; H. f. & T. Fl. Ind. 133; Miq. Fl. Ind Bat. I, Pt. 2, 41; Beddome Ic. Pl. Ind Or. t. 51; Bl. Fl. Javæ Anon. 53; A. DC. Mem. 28; W. and A. Prod. 9; Thwaites Enum. 9; Kurz For. Fl. Ind. Burm. I. 34; Hook. fil. Fl. Ind. I, 59. Scheff. Obs. Phyt. Anon. 5. Nat. Tidsch. Ned. Ind. XXXI, 5. *U. cordifolia*, Roxb. Fl. Ind. II, 602? *U. Dunalii*, H. f. & T. Fl. Ind. 131 (the Concan plant); Dalz. & Gibs. Fl. Bomb. 3 (not of Wallich). *U. Amherstiana*, A. DC. Mem. 28. *U. biglandulosa*, Bl. Bijdr. 16. *U. Roxburghiana*, Wall. Cat. 6423 B. *U. Lessertiana*, Dunal Anon. 107. t. 26; DC. Prod. I, 90. *Desmos chinensis* Lour. Fl. Coch. Ch. 1, 352.

Of this variable and abundant species, Sir Joseph Hooker distinguishes four varieties as follows:—

Var. 1, *pubiflora*; leaves 5–7 in., oblong acute, base often cordate, flowers silky.

Var. 2, *lævigata*; leaves 3–4 in., oblong or lanceolate, acute, base rounded, flowers almost glabrous.—*U. chinensis*, DC. Prodr. i. 90. *U. undulata*, Wall. Pl. As. Rar. iii. and 42. *U. discolor*, Dalz and Gibs, Fl. Bomb. 3. t. 265; Wall. Cat. 6428.—Perhaps cultivated only in India, common in the Archipelago and China.

Var. 3, *pubescens*; leaves as in 1, but densely pubescent beneath.

Var. 4, *latifolia*; leaves 3–5 by 2–2½ in, broad-oval, acute, flowers silky. *U. discolor* and var. b, *bracteata* Bl. Fl. Jav. Anon. 53, t. 26 and 31A.

From the base of the eastern Himalaya through the Assam range to Burmah and the Malayan Peninsula; in tropical forests. Distrib. The Malayan Archipelago, Chinese Mountains.

4. Unona dumosa, Roxb. Fl. Ind. II, 670. A large bushy climber: young branches slender, softly rufous-tomentose. *Leaves* membranous, broadly ovate to oblong-ovate, obovate to oblanceolate-oblong, obtuse, sub-acute or broadly mucronate, the base rounded or sub-cordate, or sub-cuneate; when young rufous-tomentose on both surfaces; the upper except the midrib glabrescent when old: main nerves 10 to 12 pairs, sub-ascending, rather straight; length 2 to 5·25 in., breadth 1·25 to 2·5 in.; petiole ·15 in., to 3 in., rufous-tomentose. *Flowers* solitary, leaf-opposed or extra-axillary, 2 to 2·5 in. long; pedicels ·5 to ·75 in. long,

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rufous-tomentose, with a single ovate bract near the base. *Sepals* coriaceous, cordate or ovate, sub-acute or acute, spreading, rufous-tomentose, ·4 in. long. *Petals* obovate-spathulate to broadly ovate-lanceolate, tapering to each end, vertically nerved, densely pubescent at first, less so when old; the inner row smaller. *Ripe carpels* numerous, stalked, glabrous, ·75 to 1·4 in. long, much constricted between the 2 to 3 ovoid joints. *Seeds* shining, the albumen with transverse fibres. Wall. Cat. 6429. H. f. and Th. Fl. Ind. 131; Hook. fil. Fl. Br. Ind. I, 59.

Malacca: Maingay, Nos. 42 and 43 (Kew Distrib.). Perak; King's Collector, L. Wray Junior. Sylhet; Roxburgh, Wallich. Assam; Simons.

The form which occurs in the Malayan Peninsula has narrower petals than that which is found in Assam and Silhet, and its leaves are more oblong and less ovate.

5. UNONA LONGIFLORA, Roxb. Fl. Ind. II, 668. A glabrous shrub or small tree, the leaf-buds silky; young branches slender. *Leaves* membranous, narrowly oblong or oblong-lanceolate, more or less acuminate, the base rounded or slightly cuneate; upper surface shining, the lower glaucous: main nerves 12 to 16 pairs, oblique, rather prominent beneath: length 6·5 to 11 in., breadth 1·75 to 3·25 in., petiole ·4 in. *Flowers* solitary, pedunculate, axillary, pendulous, 3·5 to 6 in. long; the peduncles minutely bracteolate and jointed near the base, slender, from 1·25 to 8 in. long, still longer in fruit. *Sepals* very small, broadly triangular, spreading, mucronate, rufous-pubescent externally. *Petals* linear-lanceolate, much acuminate, cohering by their margins, the base slightly expanded, no constriction between the limb and claw, adpressed-sericeous when young but afterwards glabrous, yellowish; the inner row absent. *Stamens* with the connective produced and truncate at the apex. *Ovaries* 10 to 20, sessile, hairy; *ovules* few: stigmas large, recurved. *Ripe carpels* about 10, stalked, moniliform, 3- to 4-jointed, all the joints except the lowest often falling off: individual joints elongated-ovoid, ·5 in. long, glabrous. *Seeds* with thin smooth testa, the albumen intersected by numerous horizontal fibrous processes. Wall. Cat. 6419; Hook. fil. and Th. Fl. Ind. 134; Hook. fil. Fl. Br. Ind. I, 61; Kurz Fl. Burm. I, 35.

Perak; in forests under 3,000 feet. E Himalaya; Assam; Khasia Hills, Chittagong.

Most of the specimens which I have seen from Assam, the Khasia Hills, and Chittagong have flower-pedicels under 2 inches long, and petals quite 6 inches long. Specimens from Perak, on the other hand, have shorter flowers (3 to 4 in. long); and much longer (5 or 6 in.) and more slender peduncles: otherwise the two sets agree. In many of the flowers from both sets of localities there are only two petals.

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6. UNONA DASYMASCHALA, Blume Fl. Jav. Anon. 55, t. 27. An erect or sarmentose shrub: young branches sometimes glabrous from the beginning, but usually at first softly rufous-pubescent and sometimes permanently so. *Leaves* thinly coriaceous, elliptic-oblong, oblong, or oblong-lanceolate or oblanceolate, acute or shortly acuminate, the base rounded or narrowed; upper surface glabrous; the lower sub-glaucous, glabrous or sometimes puberulous on the midrib and nerves; length 4·5 to 8·5 in., breadth 1·5 to 3 in., petiole about ·1 in. *Flowers* pedunculate, solitary, axillary, pendulous, 1·5 to 3 in. long; peduncles 1·25 to 1·75 in. (longer in fruit), minutely bracteolate at the very base. *Sepals* fleshy, very short, broadly triangular, pubescent, reflexed. *Petals* fleshy, varying from ovate-acute to lanceolate-acuminate, concave and (in the narrower forms) expanded at the base, with a constriction between the claw and limb; the edges united when young, adpressed-puberulous but ultimately glabrous. *Anthers* with the connective expanded at the apex and oblique. *Ovaries* densely villous; the stigma narrow, glabrous. *Ripe carpels* numerous, shortly stalked, moniliform, pubescent to glabrous, the joints oval, about ·35 long. *Seeds* oval, smooth, the albumen with fibrous processes. A. DC. Mem. Anon. 28; Wall. Cat. 6421; Hook. fil. and Thoms. Fl. Ind. 135; Miq. Fl. Ind. Bat. I, Pt. 2, 42; Kurz Fl. Burm. I, 36; Hook. fil. Fl. Br. Ind. I, 61. Scheff. Obs. Phyt. Anon. 6; Nat. Tidsch. Ned. Ind. XXXI, 6.

From Burmah to Singpore; the Andaman Islands. Distrib.—Sumatra, Java.

Var. *Blumei*, Hook. fil.; branches glabrous; leaves pale-yellowish or grey beneath, glabrous or nearly so. Wall. Cat. 6420 B. (*U. discolor.*)

Var. *Wallichi*, Hook. fil.; branches brown-tomentose; lower surfaces of leaves glaucous and tinged with purple.

This species, in the absence of the inner row of petals and in other respects, resembles *M. longiflora*, Roxb.; but the outer petals are neither so long nor so narrow, and there appear always to be three of them, and not often only two as in *M. longiflora*. The peduncles are moreover shorter. The two species, however, are closely allied. In open, exposed situations this is a non-scandent bush; but under the shade of trees, it often developes into a climber,—a habit which it shares with many species of this family. Blume's figure of this plant (quoted above) is inaccurate as respects the flowers and fruit.

7. UNONA WRAYI, Hemsl. in Hook. Ic. Plant t. 1553. A tree: young branches slender, tawny-tomentose. *Leaves* thickly membranous, elliptic-oblong, shortly acuminate, often obtuse (from the breaking off of the acumen), slightly narrowed to the rounded base; upper surface glabrous except the puberulous midrib; lower much reticulate,

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puberulous, the midrib pubescent : main nerves 8 to 10 pairs, rather prominent beneath, spreading, and forming two sets of intra-marginal arches : length 5·5 to 7·5 in., breadth 2 to 2·65 in. ; petiole ·2 in., tomentose. *Flowers* 3 to 3·5 in. long, solitary or in fascicles from tubercles on the larger branches : pedicels ·75 to ·9 in., slender. *Sepals* ovate-lanceolate, sub-acute, about ·3 in. long, puberulous. *Petals* white changing to deep claret, subequal, rather coriaceous, linear-lanceolate, acuminate, about 3 in. long, sparsely puberulous outside : breadth about ·3 in. *Ovaries* numerous, pubescent, with about 4 ovules. *Ripe carpels* red when ripe, stalked, slightly pulpy, ovoid or oblong, obtuse, glabrous, 1 to 1·25 in. long : stalks ·5 to ·75 in. long. *Seeds* about 3, oval, compressed, rugulose, aromatic, ·6 in. long.

Singapore ; Maingay (Kew Distrib.,), No. 51. Perak ; Wray, No. 560 ; King's Collector. Distrib.—Java.

8. Unona desmantha, H. f. and T. in Hook. fil. Fl. Br. Ind. I, 61. A small tree : youngest branches with soft yellowish-brown pubescence, the older with smooth, shining, yellowish-brown bark. *Leaves* coriaceous, elliptic-oblong, or elliptic-lanceolate, or oblanceolate, shortly and acutely or obtusely acuminate, the base acute ; upper surface glabrous except the pubescent midrib ; under-surface paler, puberulous especially on the midrib and nerves : main nerves 8 to 11 pairs, rather prominent beneath when dry, oblique. *Flowers* 2·5 in. diam., pale red, densely crowded on 1 to 2 in. broad flat tubercles on the older branches : peduncles ·75 in., puberulous, ebracteolate. *Sepals* ovate, acute, ·3 in. long. *Petals* unequal, linear-oblong, tapering to the apex, the base not dilated, sparsely pubescent, 1 to 1·5 in. long ; the inner rather narrower. *Torus* and *ovaries* as in *U. pycnantha*, but ovules 3 to 5, superposed. *Ripe carpels* stalked, globose, dark-coloured, glabrous, nearly 1 in. in diam. : stalk 1 to 1·5 in.

Malacca : Maingay (Kew Distrib.), No. 48.

9. Unona crinita, Hook. fil. and Thoms. Fl. Br. Ind. I, 61. A tree ? young branches slender ; their bark pale, rugose ; the youngest densely rufous-tomentose. *Leaves* membranous, oblong, elliptic-oblong or oblanceolate-oblong, acute or acuminate ; the base rounded ; upper surface quite glabrous, the lower pubescent especially on the nerves and veins : the midrib tomentose on both surfaces ; main nerves 10 to 12 pairs, slender, but slightly prominent beneath : length 3 to 8 in., breadth 1·25 to 2·5 in ; petiole ·15 in., tomentose. *Flowers* 3 to 5 in. long, pedicellate, in dense crowded fascicles from very broad (1 to 2 in. in diam.) tubercles on the larger branches ; pedicels ·15 to ·25 in. long, rusty-tomentose ; bracteole linear, or absent. *Sepals* ovate-lanceolate, much acuminate, spreading, ·5 in. to ·75 in. *Petals* subequal in length,

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narrowly linear, unequal in breadth, ·15 in. broad at the base, and at the middle, narrower between and from the middle upwards; 1-nerved; finely pubescent; the inner slightly shorter and narrower. *Torus* columnar, truncate. *Ovaries* strigose: ovules 3 to 5, 1-seriate: stigma punctiform. *Ripe carpels* globose, densely rufous-velvetty, shortly stalked.

Malacca: Maingay (Kew Distrib.), No. 41.

10. Unona stenopetala, Hook. fil. and Thoms. Fl. Ind. 136. A tree 20 to 35 feet high: young branches softly rufous-tomentose; the older dark-coloured, glabrous, striate. *Leaves* thinly coriaceous, oblong-obovate or oblanceolate, more or less acuminate, narrowed below to the slightly cordate and oblique base: both surfaces glabrous, the midrib more or less pubescent on the lower; under-surface faintly reticulate when dry; main nerves 7 to 9 pairs, curving upwards, anastomosing doubly at some distance from the edge, thin but slightly prominent: length 4 to 7 in., breadth 1·25 to 3 in.; petiole ·1 to ·25 in., rufous-tomentose. *Flowers* 1·5 to 2 in. long, almost sessile or shortly pedicelled, in fascicles of 2 to 4 on minutely bracteate extra-axillary tubercles from both branches and stem. *Sepals* united at the base, lanceolate, acuminate, the bases broad, ribbed, spreading, pubescent externally, ·4 to ·5 in. long. *Petals* sub-equal, narrowly linear, concave, slightly wider at the base, keeled, sparsely pubescent, 1·25 to 3 in. long. *Stamens* numerous, short with broad flat apices hiding the lateral anthers. *Ovaries* 4 to 7, villous, 4- or 5-ovuled. *Ripe carpels* few, sub-globular or bluntly ovate, softly tomentose at first, ultimately sub-glabrous; the pericarp thick, ·5 to ·65 in. long and ·5 in. in diam. *Seeds* 1 to 3, thickly discoid, bi-concave with grooved edge, rugulose. Hook. fil. and Th. Fl. Br. Ind. I, 60: Miquel Fl. Ind. Bat. I, pt. 2, 43: Kurz F. Flora Burma, I, 35.

Singapore: Lobb, Ridley. Penang: King's Collector, Scortechini; common. ? Burmah, (in Tenasserim): Lobb.

This is a rare plant in Burmah, if indeed it occurs there at all. The leaves of some of the Perak specimens have petioles ·5 in. long: but usually they are as above described.

### 11. Polyalthia, Blume.

Trees or shrubs with the habit of *Unona*. *Sepals* 3, valvate or sub-imbricate. *Petals* 6, 2-seriate, ovate or elongated, flat or the inner slightly vaulted. *Torus* convex. *Stamens* cuneate; anther-cells extrorse, remote. *Ovaries* indefinite; style usually oblong; ovules 1–2, basal and erect, or sub-basal and ascending. *Ripe carpels* 1-seeded, berried.—Distrib. Tropical Asiatic sp. about 45; African sp. 3; Australasian species 2.



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Sect. I. Monoon. Ovule solitary, usually basal, erect.
Flowers from the axils of the leaves or of fallen leaves, not from the trunk.
Flowers solitary.
Leaves under 5 in. in length (7 in. in *P. Sumatrana*), more or less lanceolate.
Leaves not glaucous beneath; petals ovate, acute ... ... 1. *P. dumosa.*
Leaves very glaucous beneath; petals linear-oblong, obtuse.
Ripe carpels smooth ... 2. *P. hypoleuca.*
Ripe carpels vertically ridged ... 3. *P. sumatrana.*
Leaves over 5 in. in length, not glaucous.
Flowers axillary.
Petals more or less narrowly lanceolate.
Leaves ovate-lanceolate, glabrous; ripe carpels oblong, blunt at each end ... 4. *P. andamanica.*
Leaves oblong to obovate-oblong, more or less pubescent; ripe carpels elliptic, mucronate ... ... 5. *P. magnoliaeflora.*
Petals oblong-elliptic, slightly obovate, 1·3 to 2·25 in. long ... 6. *P. macrantha.*
Flowers terminal; petals ovate-elliptic, 1 to 1·25 in. long ... ... 7. *P. pulchra.*
Flowers solitary or in pairs; ripe carpels little more than ·25 in. long.
Flowers ·4 in. in diam.; petals broadly oblong-ovate, obtuse ... ... 8. *P. Kunstleri.*
Petals 1·5 to 2 in. long, lanceolate-oblong; leaves narrowly lanceolate-oblong or elliptic-oblong ... 9. *P. Scortechinii.*
Petals ·85 to 1·5 in. long, broadly lanceolate or oblanceolate; leaves oblong-lanceolate to ovate-elliptic... 10. *P. Jenkinsii.*
Flowers in pairs; petals obovate-oblong, 1 in. long: ripe carpels ovoid; ·65 in. long ... 11. *P. Hookeriana.*
Flowers always in fascicles or cymes, axillary or from the branches below the leaves ... 12. *P. simiarum.*
Flowers in fascicles from the young branches

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below the leaves, or from the larger branches; never axillary.

Leaves 8 to 15 in. long with 12 to 16 pairs of prominent oblique or spreading nerves .. ... ... 13. *P. lateriflora.*

Leaves 6 to 8 in. long with 10 to 12 pairs of slender, spreading nerves... 14. *P. sclerophylla.*

Flowers in fascicles from tubercles on the main stem, often near its base; never axillary, and probably never from the branches.

Inflorescence serial.

Leaves under 8 in. in length.

Leaves oblong-lanceolate; nerves 8 or 9 pairs; torus of ripe fruit 1·25 in. in diam.: stalks of ripe carpels ·75 in. long ... ... 15. *P. macropoda.*

Leaves oblong; nerves 7 pairs; torus of ripe fruit ·5 in. in diam.; stalks of ripe carpels 1·5 in. long ... 16. *P. clavigera.*

Leaves elliptic to oblong, slightly oblique ... 17. *P. glomerata.*

Leaves 9 to 16 in. long; oblong-elliptic ... ... 18. *P. congregata.*

Inflorescence sub-hypogæal ... 19. *P. hypogæa.*

Sec. II. Eupolyalthia. Ovules 2 (3 in *P. Korinti*), superposed.

Flowers solitary.

Leaves under 5 in. long, not cordate at the base.

Leaves oblong-lanceolate.

Petals oblong ... ... 20. *P. obliqua.*

Petals broadly ovate or ovate-orbicular, leaves glaucous ... 21. *P. aberrans.*

Leaves upwards of 5 in. long, cordate at the base.

Petals narrowly linear ... ... 22. *P. bullata.*

Petals oblong.

Flowers 1 in. diam.... ... 23. *P. subcordata.*

Flowers 1·25 to 1·75 in. in diam. 24. *P. oblonga.*

Flowers in fascicles from the older branches.

Petals linear-oblong, 1 to 1·5 in. long: ripe

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carpels ·35 in. long, their stalks ·6 to ·75 in. long ... ... ... 25. *P. Beccarii.*

Petals linear-oblong, 2 to 3 in. long; ripe carpels ·75 to 1 in. long, sub-sessile ... 26. *P. cinnamomea.*

Petals oblong-lanceolate or oblanceolate, ·9 to 1·5 in. long; ripe carpels 1·75 in. long, their stalks ·25 in. long ... ... 27. *P. pachyphylla.*

Petals linear, obtuse, ·5 to ·75 in. long ... 28. *P. pycnantha.*

1. POLYALTHIA DUMOSA, King n. sp. A shrub; young branches slender, glabrous. *Leaves* thinly coriaceous, lanceolate or oblong-lanceolate, acuminate, the base rounded; both surfaces dull, glabrous, very minutely lepidote; main nerves 8 or 9 pairs, spreading, faint, inter-arching far from the margin; length 2·5 to 3·25 in., breadth ·5 to ·9 in., petiole less than ·1 in. *Flowers* solitary, leaf-opposed, ·3 to ·35 in. long; pedicels slender, glabrous, ·3 to ·4 in. long with a small lanceolate bracteole about the middle. *Sepals* thick, spreading, broadly ovate, acute or acuminate, ·1 in. long, glabrescent outside, quite glabrous inside. *Petals* leathery, subequal, narrowly oblong, acuminate, not widened at the base, sub-corrugated and glabrous outside, puberulous inside, ·3 in. long. *Stamens* numerous, short; the apical process very broad, rhomboid, truncate, projecting much over the apices of the short dorsal anther-cells. *Ovaries* very few, oblong, pubescent; stigma broad, sessile, hairy. *Ripe carpels* one or two, ovoid-globose, glabrous, cherry-red when ripe, ·25 to ·3 in. long.

Perak; elevat. about 1,200 feet; Wray, Scortechini.

Near *P. suberosa*, H. f. and Th. but with different venation, fewer carpels, and without hypertrophied bark.

2. POLYALTHIA HYPOLEUCA, Hook. fil. and Thoms. in Fl. Br. Ind. I, 63. A tree 50 to 80 feet high; young branches slender, rather pale, striate; all parts glabrous except the flowers. *Leaves* coriaceous, oblong-lanceolate or elliptic-lanceolate, shortly acuminate, the base acute, the edges slightly recurved when dry, upper surface shining, the lower dull, pale: main nerves many pairs, invisible on either surface except in some occasional leaves when dry: length 2·5 to 5 in., breadth ·75 to 1·75 in., petiole ·2 to ·3 in. *Flowers* sub-erect, small (only ·3 to ·4 in. long) pedicelled, solitary or sub-fascicled, mostly from the axils of fallen leaves: pedicel stout, about ·15 in. long, tomentose and with about two cucullate bracts near the base. *Sepals* very small, triangular, pubescent, deciduous. *Petals* linear-oblong, obtuse, not dilated at the base, grey-pubescent on both surfaces. *Ripe carpels* few, often solitary, stalked, elliptic-oblong, obtuse, glabrous, ·8 in. long: stalks ·1 to ·25 in. *Seed* ovoid-elliptic, blunt, dark-coloured, transversely striate.

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Singapore: Maingay, No. 50, (Kew Distrib.) Perak; King's Collector.

This approaches *Guatteria sumatrana*, Miq. in its leaves: but that species has much larger flowers. But this is still more allied to *Guatteria hypoglauca*, Miq., from which it differs by its much larger fruit. The plant named *P. hypoleuca* by Kurz in his Forest Flora of Burmah is, as he himself informed Sir Joseph Hooker in a letter, really *P. sumatrana*. Neither species, however, appears to me to occur either in the Andamans or Burmah.

3. POLYALTHIA SUMATRANA, King (not of Kurz.) A tree 30 to 60 feet high: young branches pale, the older much furrowed: all parts glabrous except the flowers. *Leaves* coriaceous, oblong-lanceolate, acuminate, the base acute; upper surface shining, the lower dull glaucous, both pale (when dry); main nerves 15 to 20 pairs, very slender and little more prominent than the secondary; length 4·5 to 6·5 in., breadth 1·25 to 1·75 in., petiole ·25 in. *Flowers* 1·4 to 1·75 in. long, solitary or in fascicles of 2 or 3 from the younger branches below the leaves, or axillary; their pedicels ·6 to ·9 in. long, minutely bracteolate near the base, glabrous. *Sepals* very small, half-orbicular-ovate. *Petals* narrowly linear-oblong, sub-acute or obtuse, puberulous, pale green to yellowish, the outer slightly longer than the inner, 1·35 to 1·75 in. long and ·15 to ·2 in. broad. *Ovaries* glabrous, sub-cylindric, with a single ovule: stigma hairy. *Carpels* ovoid, tapering to each end, ridged (when dry), pubescent or glabrous, about 1 in. long and ·6 in. in diam.; their stalks ·5 to ·6 in. long. *Guatteria sumatrana*, Miq. Fl. Ind. Bat. Suppl. 380. *Monoon sumatranum*, Miq. Ann. Mus. Lugd. Bat. II, 19.

Perak; at elevations up to 2,500 feet, common. Distrib.: Sumatra, Korthals, Beccari P. S., No. 613. Borneo, Korthals.

This is allied to *P. hypoleuca*, H. f. and Th.; but has larger leaves, much larger flowers, and slightly different carpels.

4. POLYALTHIA ANDAMANICA, Kurz Andam. Report (1870) p. 29. A shrub: young branches slender, tomentose. *Leaves* membranous, ovate-lanceolate, acute; the base broad and rounded, slightly unequal; some of the larger nerves underneath and the midrib on both surfaces pubescent near the base, otherwise glabrous and shining; main nerves 6 or 7 pairs, distant, spreading and forming bold arches far from the margin: reticulations minute, distinct: length 4·5 to 6 in., breadth 2 to 2·4 in.; petiole ·2 in., pubescent. *Flowers* axillary or extra-axillary, solitary, 2 in. in diam.; the pedicel ·4 to ·75 in. long, sub-pubescent, minutely bracteolate. *Sepals* minute (·1 in. long), broadly triangular, pubescent. *Petals* thinly coriaceous, sub-equal, oblong, blunt, 1 in. long. *Ripe carpels* 6 to 8, oblong, smooth, glabrous, slightly apiculate, ·5 or ·6 in.

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long and ·15 to ·2 in. in diam., their stalks nearly as long. *P. Jenkinsii*, Benth. and Hook. fil. in Hook fil. Fl. Br. Ind. I, 64 (*in part*); Kurz Flora Burm. I, 38.

S. Andaman: Kurz, Man, King's Collector.

Allied to *P. Jenkinsii*, H. f. and T.; but with much smaller flowers, and leaves with broader bases.

5. Polyalthia magnoliæflora, Maing. MSS. Hook fil. Fl. Br. Ind. I, 64. A tree 30 to 40 feet high; young branches rusty-tomentose. *Leaves* thinly coriaceous, oblong to obovate-oblong, obtuse or acuminate, the base rounded or minutely cordate; upper surface glabrous, the nerves and midrib minutely tomentose; under surface at first pubescent, ultimately glabrous or glabrescent: main nerves 15 to 20 pairs, rather straight, oblique, prominent beneath, the transverse veins almost straight, distinct; length 8 to 12 in., breadth 2·5 to 3·5 in.; petiole ·25 in. stout, tomentose. *Flowers* large, shortly pedunculate, solitary, axillary, 2·5 to 3 in. long; peduncle ·3 in. long, tomentose, with 2 large ovate bracts. *Sepals* coriaceous, short, broadly ovate, acute, spreading, tomentose. *Petals* coriaceous, white, linear-oblong or oblong-lanceolate, sub-acute, tomentose. *Torus* conical. *Ovaries* hirsute. *Carpels* (unripe) stalked, oblong-ovoid, blunt at either end, the apex mucronate, pubescent. *Seed* with smooth shining testa.

Malacca: Maingay, Perak; King's Collector, No. 10039.

Evidently a rare species. I have seen only Maingay's imperfect specimens from Malacca, and two collected on Ulu Bubong by the late Mr. H. H. Kunstler, Collector for the Bot. Garden, Calcutta. Sir J. D. Hooker states (F. B. Ind. l. c.) on Maingay's authority that the flowers have the colour and odour of those of a *Magnolia*.

6. Polyalthia macrantha, King n. sp. A tree 20 to 70 feet high; young branches rather slender, glabrous. *Leaves* large, thinly coriaceous, oblong to elliptic-oblong, acute, slightly narrowed below the middle to the rounded or minutely cordate base; upper surface shining, glabrous except the depressed slightly puberulous midrib; lower surface paler when dry, glabrous, very minutely lepidote; main nerves 20 to 24 pairs, spreading, thin but prominent beneath; length 12 to 18 in., breadth 4·5 to 7·5 in., petiole ·4 in., stout. *Flowers* solitary, axillary or slightly supra-axillary, 2·5 to 4·5 in. in diam.; pedicels 1·5 to 2 in. long (longer in fruit) glabrescent, with a sub-orbicular bracteole about the middle; the buds conical when young. *Sepals* thick, sub-orbicular, spreading, connate by their edges and forming a cup ·75 in. in diam., puberulous on both surfaces, corrugated outside. *Petals* much larger than the sepals, white, thick, fleshy, flattish, oblong-elliptic, widest above the middle, blunt, puberulous on both surfaces except at the glabrescent

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bases, nerved inside; the outer row 1·3 to 2·5 in. long, the inner smaller. *Stamens* numerous, compressed; apical process of connective truncate. *Ovaries* few, oblong, puberulous; stigmas large, capitate-truncate, pubescent. *Ripe carpels* elliptic-ovoid, sometimes oblique, blunt at each end, the apex mucronate, glabrous, 1 to 1·25 in. long, and ·75 in. in diam. *Seed* ovoid, solitary, the testa corrugated.

Perak; King's Collector, Scortechini.

A remarkable species with handsome white flowers, allied in many ways to *P. congregata*; but at once distinguished from it by its axillary, solitary flowers and glabrous ripe carpels.

7. Polyalthia pulchra, King. A small tree, glabrous except the inflorescence. *Leaves* thinly coriaceous, elliptic to oblong-lanceolate or oblong-oblanceolate, acute or acuminate, the base acute; both surfaces minutely muriculate, the lower paler and dull; length 4·5 to 6 in., breadth 2·5 in. (only 1·75 in. in var. *angustifolia*), petiole ·25 in. *Flowers* large, solitary, terminal, 2 in. or more in diam. when expanded (often 3·5 in. in diam. in var. *angustifolia*): pedicels 1·4 to 1·75 in. long, puberulous, with a lanceolate foliaceous bracteole at the base. *Sepals* ovate, acute or sub-acute, nerved, glabrous, ·6 to ·75 in. long. *Petals* coriaceous, sub-equal, ovate-elliptic, sub-acute, the base slightly cordate (narrowly oblong-lanceolate in var. *angustifolia*) greenish-yellow with a triangular blotch of dark purple at the base. *Stamens* numerous; apical process of connective broad, truncate, sub-orbicular, projecting over the apex of the linear anther-cells, pubescent. *Ovaries* oblong, adpressed-pubescent, 1-ovuled; style short, cylindric, thick, crowned by the convex, terminal, pubescent stigma. *Ripe carpels* numerous, elliptic-ovoid, blunt, slightly contracted at the base, sparsely pubescent but becoming almost glabrous, purple when ripe; pericarp sub-succulent: stalks thick, crimson when ripe, 1·5 in. long. *Seed* solitary, elliptic.

Perak: at Weld's Rest, Scortechini.

Var. *angustifolia*, King. *Leaves* oblong-lanceolate or oblong-oblanceolate, scarcely muriculate; petals lanceolate or narrowly oblong-lanceolate, often 1·75 in. long; sepals often ·75 in. long.

Perak; on Gunong Bubu; elevat. 5,000 feet, Wray.

8. Polyalthia Kunstleri, King n. sp. A shrub or small tree; young branches puberulous, speedily glabrous. *Leaves* oblong-lanceolate rarely elliptic-lanceolate, shortly and rather bluntly acuminate, the base narrowed and sub-acute or rounded; upper surface glabrous, shining; the lower paler, dull, puberulous on the midrib and nerves; main nerves 6 to 12 pairs, rather prominent beneath, ascending, inter-arching ·1 to ·2 in. from the margin; length 4·5 to 8 in., breadth 1·5 to 2·35 in.; petiole ·2 in., pubescent. *Flowers* ·4 in. in diam., axillary or extra-axillary,

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solitary or in pairs; peduncles ·25 in. long, each with two rather large unequal, broadly ovate bracts above the base. *Sepals* broadly triangular-ovate, obtuse, nearly as long as the petals and, like them, minutely tomentose. *Petals* sub-equal, broadly oblong-ovate, obtuse. *Ovule* solitary. *Fruit* 2 in. in diam.; individual carpels numerous, ovoid-globular, apiculate, ·3 in. long; stalks slender, ·5 in. long, adpressed rufous-pubescent like the carpels. *Ellipeia parviflora*, Scortechini MSS.

Perak: King's Collector, Scortechini, Wray.

This much resembles *P. Jenkinsii* and *P. andamanica* in its leaves and fruit: but its flowers are totally different.

9. Polyalthia Scortechinii, n. sp. King. A small tree 15 to 20 feet high; young branches minutely rufous-tomentose, but speedily glabrous. *Leaves* thinly coriaceous, oblong or oblong-elliptic, acute or shortly acuminate, the base rounded or sub-acute; upper surface glabrous, shining, the midrib pubescent; the lower dull, very minutely dotted, the midrib and sometimes nerves puberulous; main nerves 8 to 11 pairs, bold and prominent on the lower surface, oblique, inter-arching close to the edge: length 4 to 8 in., breadth 1·15 to 2·25.; petiole ·25 in., pubescent. *Flowers* pedicelled, solitary or in pairs, from the axils of leaves or of fallen leaves: pedicels ·5 to ·75 in. long, rufous-tomentose, with a rather large bract about the middle. *Sepals* small, triangular, pubescent. *Petals* fleshy, sub-equal, greenish-yellow changing into dark dull yellow, oblong-lanceolate or oblong-oblanceolate, acute or rather blunt, the edges wavy, both surfaces minutely pubescent, 1·5 to 2 in. long. *Ovaries* narrowly elongate-adpressed, pubescent, each crowned by large fleshy glabrous stigma. *Ovule* solitary, basal. *Fruit* shortly stalked; ripe carpels numerous pedicelled, ovoid, crowned by the remains of the stigma, sparsely pubescent, ·3 in. long; pedicel slender, pubescent, ·75 in. long. *Seed* with pale smooth testa. *P. Jenkinsii*, H. f. and T. (*in part*). *Ellipeia undulata*, Scortechini MSS.

Malacca: Griffith, No. 413. Perak, King's Collector, Scortechini. Distrib.:—Sumatra, Beccari, Nos. 935, 976.

10. Polyalthia Jenkinsii, Benth. and Hook. fil. Gen. Pl. I, 25. A tree: young shoots sparsely rufous-pubescent. *Leaves* membranous, oblong-lanceolate to elliptic-ovate, acute or shortly acuminate, slightly narrowed to the acute or rounded sub-oblique base; both surfaces glabrous, minutely reticulate, the upper shining and the midrib puberulous; main nerves about 7 pairs, slender, slightly prominent beneath, inter-arching at some distance from the edge: length 4 to 7 in., breadth 1·35 to 3 in., petiole ·2 to ·3 in. *Flowers* large (1·75 to 3 in. in diam.), pedicelled, solitary, rarely in pairs, axillary: pedicels ·6 to ·75 in. long, pubescent, and with several small rounded bracts near the base. *Sepals*

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very small, sub-orbicular, puberulous. *Petals* sub-coriaceous, spreading, greenish changing to yellow, broadly lanceolate or oblanceolate, sub-acute or obtuse, the base much narrowed, puberulous or glabrous. *Ripe carpels* numerous, stalked, oblong, slightly apiculate, glabrous, ·4 in. long: stalk slender, ·6 in. long. *Seed* smooth. Hook. fil. Fl. Br. Ind. Ind. I, 64 (*in part*); Kurz For. Fl. Burm. I, 375 (*in part*); *Guatteria Jenkinsii*, Hook. fil. and Thoms. Fl. Ind. 141; Miq. Fl. Ind. Bat. I, pt. 2, p. 46. *Guatteria Parveana* Miq. Fl. Ind. Bat. Vol. I, Pt. 2, p. 48, and Suppl. 378. *Uvaria canangioides*, Reichb. fil. et Zoll. MSS. *Monoon canangioides*. Miq. Ann. Mus. Lugd. Bat. II, 18.

Malacca; Griffith; Maingay, No. 46 (and 45 *in part*) (Kew Distrib.). Perak; King's Collector, No. 3910. Assam and Silhet.

Specimens from Perak have larger flowers than those from Assam; but otherwise they agree fairly well, and both appear to be specifically identical with the Sumatra plant named *Guatteria* or *Monoon canangioides* by Miquel. The Andaman plant which Kurz originally (Andam. Report (1870) p. 29) named *Polyalthia andamanica*, but which Sir Joseph Hooker (dealing with imperfect materials) reduced (with Kurz's assent) to this species, I have restored to specific rank. Recently received specimens show its flowers to be different from those of true *P. Jenkinsii* (the petals being shorter and narrower), while the carpels are larger.

11. Polyalthia Hookeriana, King n. sp. A tree 20 to 70 feet high: young branches softly tawny-pubescent, ultimately glabrous and darkly cinereous. *Leaves* membranous, obovate-elliptic or oblanceolate, shortly acuminate, narrowed from above the middle to the sub-cuneate base; both surfaces reticulate, the upper glabrous except the pubescent midrib and nerves: lower glabrous, the midrib and nerves adpressed-pubescent: main nerves 10 or 11 pairs, oblique, forming imperfect arches close to the edge, prominent beneath; length 5 to 7 in., breadth 2·25 to 3·25 in.; petiole ·15 to ·2 in., tomentose. *Flowers* in pairs from peduncles with several aborted flowers near their bases, extra-axillary: pedicels ·5 to ·75 in. long, lengthening in fruit, stout, pubescent, with 1 or 2 small ovate bracteoles at the middle or below it. *Sepals* broadly ovate, concave, free or connate only at the base, pubescent outside, glabrous within, ·2 in. long. *Petals* coriaceous, yellowish, subequal, ovate or obovate-oblong, sub-acute, puberulous except at the base inside, only slightly contracted at the base, nearly 1 in. long. *Stamens* numerous, very short, cuneate; the apical process of the connective thick with a truncate orbicular top hiding the linear dorsal anthers. *Ovaries* short, oblong, puberulous, with 1 ovule: stigma sessile, large, obovate with sub-truncate lobed apex. *Ripe carpels* numerous, ovoid, slightly apicu-



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late at the top and somewhat narrowed at the base, ·65 in. long, stalks 1·2 in. long. *Seed* solitary, ovoid, smooth, with a vertical furrow.

Malacca: Maingay (Kew Distrib.). No. 96. Perak; King's Collector; Wray.

This is a common tree in Perak. In Malacca, however, it appears to be rare; for it is so very imperfectly represented in Maingay's great Malayan collection (of which the best set is at Kew), that Sir Joseph Hooker, while recognising it as a *Polyalthia*, had not sufficient material to enable him to describe it in his Flora of British India.

12. POLYALTHIA SIMIARUM, Benth. and Hook. fil. Gen. Pl. I, 25; Hook. fil. Fl. Br. Ind. I, 63. A tree 50 to 80 feet high; all parts glabrous except the puberulous leaf buds, under surface of nerves of leaves and inflorescence; young branches pale brown, striate, sparsely lenticellate. *Leaves* sub-coriaceous, ovate-oblong to oblong-lanceolate, acute or shortly acuminate, the base rounded or sub-acute; upper surface shining; lower dull, sometimes puberulous on the midrib and nerves; main nerves 12 to 16 pairs, oblique, prominent beneath; length 5 to 11 in., breadth 2 to 4·5 in., petiole ·25 in. *Flowers* pedicelled, in few-flowered sessile fascicles from the axils of fallen leaves or from tubercles on the larger branches: pedicels minutely pubescent, with a small bract below the middle, 1 to 1·25 in. long. *Sepals* small, bluntly triangular, recurved, pubescent outside. *Petals* spreading, linear, sub-acute or acute, greenish-yellow to purplish, puberulous outside, glabrous inside, 1 to 1·25 in. long, the inner rather the longer. *Ripe carpels* stalked, ovoid-elliptic, slightly mammillate, contracted towards the base, glabrous and orange-red to bluish-black when ripe, 1·25 to 1·5 in. long: stalk from 1 to 1·75 in. *Seed* ovoid, grooved, transversely striate. Kurz For. Fl. Burm. I, 37; Hook. fil. Fl. Br. Ind. I, 63. *Guatteria simiarum*, Ham., Wall. Cat. 6440; Hook. fil. and Thoms. Fl. Ind. 142. *G. fasciculata*, Wall. MSS. ex Voigt Hort. Sub. Calc. 16. *Polyalthia lateriflora*, Kurz (not of King), Journ. As. Soc. Beng., Pt. 2, (for 1874) 52. *Unona simiarum*, H. Bn., Pierre Fl. Forest. Coch-Chine, t. 23.

Andamans, Bot. Garden Collectors. Perak, King's Collector. Forests at the base of the Eastern Himalaya, the Assam range, Chittagong, Burmah.

Var. *parvifolia*, King: leaves smaller than in typical form (3·5 to 6 in. long and 1·25 to 2·25 in. broad) puberulous beneath.

Perak; at elevation of 3,000 to 4,000 feet. Distrib. Sumatra: on Goenong Trang, Lampongs. (Forbes, No. 1536).

13. POLYALTHIA LATERIFLORA, King. A tree 50 to 70 feet high: young branches lenticellate and striate; all parts except the inflorescence quite glabrous. *Leaves* coriaceous, oblong to elliptic-oblong

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abruptly acute or shortly acuminate, slightly narrowed to the rounded rarely sub-cordate and unequal base: upper surface shining, the lower paler, rather dull: main nerves 12 to 16 pairs, rather prominent, oblique spreading, evanescent at the tips: length 8 to 15 in., breadth 2·5 to 7 in.; petiole ·3 in. stout. *Flowers* in fascicles from tubercles on the stem and larger branches, pedicelled, 1·25 to 2 in. long; pedicels slender, thickened upwards, pubescent, with 2 bracteoles about the middle, 1·25 to 1·75 in. long. *Sepals* coriaceous, ovate-orbicular, very short, densely and minutely tomentose outside. *Petals* coriaceous, greenish-yellow, dull crimson at the base, oblong-lanceolate, gradually tapering to the sub-acute apex, the outer rather shorter than the inner, minutely pubescent especially on the outer surface. *Ripe carpels* ovoid-elliptic, blunt, slightly narrowed to the base, glabrous, 1·25 in. long and ·7 in. in diam.; the pericarp thin, fleshy: the stalks stout, glabrous, sub-asperulous, 1·25 to 2 in. long. *Guatteria lateriflora*, Bl. Bijdr. 20: Fl. Jav. p. 100, t. 50 and 52 D.: Miq. Fl. Ind. Bat. I, pt. 2 p. 47. *Monoon lateriflorum*, Miq. Ann. Mus. Lugd. Bat. II, 19.

Perak; at low elevations, Wray, King's Collector. Distrib: Java.

This is closely allied to *P. simiarum*, Benth. and Hook. fil.: but has smaller flowers which are often borne on the smaller branches; smaller leaves; and shorter stalked carpels. Moreover the leaves and young branches of this are invariably glabrous. The leaves of old trees are very markedly smaller than those on young specimens. Specimens in young fruit of a plant which may belong to this species have been recently received from the Andamans from the Collectors of the Bot. Garden, Calcutta: but, until the receipt of fuller material, I hesitate to include these islands in the geographical area of the species.

14. Polyalthia sclerophylla, Hook. fil. and Thoms. Fl. Br. Ind. I, 65. A glabrous tree: young branches pale. *Leaves* coriaceous, oblong, ovate or linear-oblong, acute or obtusely acuminate, the base broadly cuneate, shining on both surfaces and with the reticulations distinct; main nerves about 10 to 12 pairs, spreading, slender: length 6 to 8 in.: breadth 1·5 to 2·6 in., petiole ·5 in. *Flowers* pedunculate, in fascicles from small tubercles on the trunk, 2 in. in diam, greenish: tubercles ·5 to 1 in. in diam.: peduncles 1 to 1·5 in. long, stout, rusty-pubescent, becoming glabrous; bracts small, orbicular, from about the middle of the peduncle. *Sepals* ovate, obtuse, short. *Petals* linear-oblong, obtuse, the base slightly concave, puberulous on both surfaces, 1·6 in. long, the inner rather smaller. *Torus* broad, flat, the edge raised. *Ovaries* pilose, shorter than the cylindric style. *Ripe carpels* elliptic-oblong, slightly narrowed at either end, 1 to 1·5 in. long, glabrous, the pericarp thin: stalks 1 to 1·5 in. long. *Seed* oblong, the testa shining, pale.

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Malacca; Maingay (Kew Destrib), No. 101.

I have seen only Maingay's Malacca specimens of this plant.

15. POLYALTHIA MACROPODA, King n. sp. A tree 50 to 60 feet high; young branches rather pale, pubescent but speedily glabrous. *Leaves* membranous, oblong-lanceolate, shortly acuminate, the base acute; the edge slightly revolute; upper surface shining, glabrous except the puberulous sulcate midrib; the lower paler when dry, minutely lepidote, sparsely strigose on the midrib and 8 or 9 pairs of curving rather prominent nerves; length 3·5 to 5·5 in., breadth 1·4 to 2·1 in., petiole ·25 in. *Flowers* nearly 1 in. long, in fascicles on short broad rugose woody tubercles from the stem close to its base: pedicels about 1 in. long, woody in fruit and 2 in. or more in length, glabrous; bracteoles (if any) deciduous. *Sepals* broadly ovate, acute, spreading, corrugated and glabrescent outside, glabrous inside, connate at the base to form a cup ·65 in. in diam. *Petals* elliptic, blunt, slightly constricted about the middle, sub-equal, puberulous, coriaceous. *Stamens* numerous, compressed especially the outer rows; apical process of connective transversely elongated, truncate. *Ovaries* numerous, oblong-ovoid. *Ripe fruit* with large woody sub-globular torus 1·25 in. in diam.; *ripe carpels* numerous, oblong-ovoid, tapering to the apex, the base gradually narrowed into a stalk, 2·5 to 3·5 in. long (including the stalk); pericarp rather fleshy, glabrous. *Seed* solitary, elongated-ovoid, grooved vertically.

Perak: King's Collector, Singapore, Ridley.

A species remarkable for its large ripe carpels borne on the stem near the ground. It is possible that Mr. Ridley's plant, collected in Singapore, may really belong to a distinct species, the only specimen of it which I have seen being very imperfect. This comes very near *P. clavigera* King.

16. POLYALTHIA CLAVIGERA, King n. sp. A tree 30 to 40 feet high; young branches slender, at first puberulous but speedily glabrous and pale. *Leaves* thinly coriaceous, oblong, tapering to each end, acuminate; both surfaces reticulate; the upper shining, glabrous except the puberulous sulcate midrib; lower surface slightly puberulous at first but ultimately quite glabrous: main nerves 7 pairs, ascending, curved, not inter-arching, slightly prominent beneath, obsolete above; length 5·5 to 8·5 in., breadth 1·75 to 2·5 in.; petiole ·4 in. slightly winged above. *Flowers* unknown. Peduncle of ripe fruit stout, woody, 2 in. or more in length; the torus depressed-globular, woody, about ·5 in. in diam.: *ripe carpels* ovoid-elliptic, tapering to each end, the base gradually passing into the stout puberulous slightly scabrid stalk, greenish-yellow when dry, glabrous: the pericarp succulent; length 2·25 in., breadth nearly 1 in.; stalk 1·5 in. puberulous; seed solitary, ovoid.

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Penang: Pinara Bukit, elevat. 2000 feet. Curtis (No. 2444). Perak: Waterfall Hill, Wray. Distrib. E. Sumatra, Forbes (No. 1638).

This species is known only by a few fruiting specimens collected by Messrs. Curtis and Wray Junior. It is nearly allied to *P. macropoda*, King; but its leaves have different venation and texture, the torus of the ripe fruit is smaller, while the carpels themselves are larger and have longer stalks.

17. POLYALTHIA GLOMERATA, King n. sp. A tree 40 to 50 feet high: young branches glabrous, pale, rather slender. *Leaves* membranous, elliptic to oblong, slightly oblique, acute or shortly acuminate, the base slightly cuneate or rounded; both surfaces reticulate, glabrous; the midrib alone puberulous on the upper, adpressed-puberulous on the lower; main nerves 7 to 8 pairs, curved, ascending, not inter-arching, thin but slightly prominent beneath; length 4 to 6 in., breadth 1·8 to 2·6 in., petiole ·25 to ·35 in. *Flowers* about 1 in. long, in clusters of 20 to 30 from nodulated puberulous tubercles on the stem; pedicels long (1·5 to 2·5 in.), slender, puberulous, with an ovate-lanceolate bracteole about the middle. *Sepals* thick, lanceolate-acuminate with broad connate bases, sub-erect, puberulous. *Petals* coriaceous, sub-erect, linear-oblong, slightly concave and glabrous at the base inside, otherwise minutely tomentose, the inner slightly smaller than the outer. *Stamens* numerous; the connective with an orbicular sub-convex apical expansion concealing the linear dorsal anther-cells. *Ovaries* much less numerous than the stamens, oblong, hirsute, apparently 1-ovuled; the stigma small, oblong, slightly pubescent.

Perak; King's Collector, Wray. Distrib. Sumatra; Forbes, No. 2804.

In all the flowers I have examined the pistils are very small (as if undeveloped) and I have not been able to find more than one ovule. In the Sumatran specimens the flowers are much longer than in those from Perak.

18. POLYALTHIA CONGREGATA, King n. sp. A tree 40 to 60 feet high; young branches at first rusty-puberulous but speedily glabrous and dark-coloured. *Leaves* thinly coriaceous, oblong-elliptic, acute, slightly narrowed to the rounded or minutely cordate base; upper surface glabrous except the depressed puberulous midrib; the lower pale when dry, glabrous, minutely lepidote; main nerves 13 to 19 pairs, oblique, curving, thin but prominent beneath; length 9 to 16 in., breadth 3·75 to 7 in.; petiole ·3 or ·4 in. stout. *Flowers* large, in short, much divided, rough, tubercular, woody cymes from the stem near its base; the pedicels 1·25 to 1·75 in. long, glabrescent; bracteole single, sub-orbicular, clasping, infra-median. *Sepals* thick, broadly ovate-triangular,

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spreading, slightly cuneate at the base, concave, corrugated and puberulous outside, glabrous inside, often reflexed, ·5 in. long. *Petals* thick, white, ovate-elliptic, sub-acute, hoary-puberulous except at the base inside on both surfaces; the outer row 1·5 to 3 in. long and ·65 to 1 in. broad, the inner row narrower. *Stamens* numerous, compressed; the apical process of the connective truncate, oblique, granular; anther-cells linear, dorsal. *Ovaries* 20 to 30, oblong, strigose, with a single basilar ovule; stigma oblong, pubescent. *Ripe carpels* elliptic, beaked, 1 in. or more long, hoary-pubescent, narrowed at the base into the short, thick stalk. *Seed* solitary, pale brown, shining, elliptic.

Perak; Scortechini, King's Collector.

This resembles *P. macrantha*, King; but is distinguished from it by its cymose, cauline inflorescence, smaller flowers and puberulous fruit. H. O. Forbes collected in the Lampongs in Eastern Sumatra a plant (No. 1642 of his Herb.) which greatly resembles this.

19. Polyalthia hypogaea, King, n. sp. A tree 25 to 30 feet high; young branches rather stout, densely but minutely rufous-tomentose, ultimately rather pale, striate. *Leaves* large, thinly coriaceous, oblong or elliptic-oblong, sometimes slightly obovate, gradually narrowed to the rounded base; both surfaces glabrous when adult, the lower puberulous when young, the veins transverse and, (like the reticulations), distinct; main nerves 18 to 22 pairs, oblique, inter-arching within the edge, thin, prominent on the lower and depressed on the upper surface when dry; length 10 to 20 in., breadth 3 to 7 in.; petiole ·4 in., stout, tomentose, *Flowering branches* from the stem near its base, 1 to 8 feet long, flexuose, rufous-pubescent like the lanceolate bracteoles. *Flowers* ·75 to 1 in. long, cream-coloured; pedicels ·75 to 1·5 in. long, usually with one lanceolate, tomentose bracteole near the middle and a second, sub-orbicular and acuminate, close to the flower. *Sepals* broadly triangular-ovate, acute, spreading, tomentose outside, glabrous inside, ·25 in. long. *Petals* coriaceous, the inner row rather smaller than the outer, narrowly oblong, sub-acute, pubescent outside except the glabrescent base and edges, inside almost glabrous. *Stamens* numerous, short, compressed; apical process of connective broad, slightly convex, slightly oblique, sub-granular, deeply ridged in front, the anther-cells linear dorsal. *Ovaries* few, oblong, villous, 1-ovuled; stigma large, ovoid, granular, sessile. *Immature carpels* narrowly ovoid, sub-compressed, the apex beaked, the base slightly contracted, minutely tomentose. *Seed* solitary, elongated, ovoid, smooth.

Perak; near Laroot, King's Collector. Gunong Batu Puteh; elev. 3,400 feet, Wray.

A species remarkable for its hypogoeal inflorescence. The flower-

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ing branches, which vary from 1 to 8 feet in length, originate from the stem near its base, pass into the soil underneath the surface of which they run for some distance, and bear on their emerging tips the flowers and fruit

20. POLYALTHIA OBLIQUA, Hook. fil. and Thoms. Fl. Ind. 138. A tree: young branches minutely pubescent, lenticellate. *Leaves* subsessile, oblong-lanceolate, acute or shortly acuminate, the base cuneate, minutely and obliquely cordate; shining and glabrous on both surfaces, the lower pale; main nerves 7 or 8 pairs, slender, curving and forming bold arches ·15 in. from the margin; length 4 to 6·5 in., breadth 1·5 to 2·2 in.; petiole ·1 in., very stout. *Flowers* ·4 to 5·4 in. in diam., solitary, pedicellate, extra-axillary; each pedicel rising from a short conical woody tubercle, curving, ·25 in. long. *Sepals* coriaceous, broadly triangular, blunt, less than half as long as the petals, pubescent. *Petals* coriaceous, sub-equal, oblong, obtuse, sericeous outside. *Ripe carpels* pisiform, with stalks ·5 in. long, dark brown. Hook. fil. Fl. Br. Ind. I, 67; Miq. Fl. Ind. Bat. I, Pt. 2, p. 44.

Malacca; Griffith, Maingay, No. 44 (Kew distrib.). Chittagong Hill Tracts; Lister. Distrib. Sumatra.

Lister's plant from the Chittagong Hill Tracts agrees well with Griffith's specimens from Malacca.

21. POLYALTHIA ABERRANS, Maing. ex Hook. fil. Fl. Br. Ind. I, 67. A large climber, glabrous except the flowers and fruit: young branches slender, black. *Leaves* membranous, oblong-lanceolate, acuminate, the base slightly cuneate; both surfaces reticulate, glabrous, the lower glaucous; main nerves 14 to 18 pairs, very faint, the secondary nerves quite as well marked: length 3·5 to 5 in., breadth 1·4 to 1·8 in., petiole ·2 to ·25 in. *Flowers* ·5 to ·75 in. in diam., solitary, axillary; pedicels slender, 1·25 in. long (longer in fruit), with one minute bracteole below the middle and another at the base. *Sepals* ovate-orbicular, sub-acute, quite connate into a 3-angled glabrous cup ·25 in. in diam. *Petals* leathery, ovate-orbicular, sub-acute, spreading, concave; the outer row ·35 in. long and ·3 in. broad, yellowish-pubescent on both surfaces except a glabrous patch near the base on the inner: inner petals half the size of the outer but more concave, hoary-puberulous outside, glabrescent inside. *Stamens* numerous; apical process of connective broad, discoid, depressed in the centre, quite concealing the long linear lateral anther-cells. *Ovaries* narrowly oblong, glabrous, 1 or 2-ovuled: style as long as the ovary, curved: stigma small. *Ripe carpels* ovoid, slightly apiculate, puberulous or glabrescent, ·35 in. long and ·3 in. in diam.; stalks ·7 to ·8 in., slender, glabrous. *Seeds* solitary, rarely 2, ovoid, shining, smooth. *Melodorum glaucum*, Scortechini MSS.

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Malacca: Maingay. Perak; Scortechini, Wray.

In some carpels there are two seeds, such carpels being about twice as long as those with a single seed. Although referred by the late lamented Father Scortechini to the genus *Melodorum*, this is an undoubted *Polyalthia* in its stamens, in its 1- rarely 2-ovuled ovaries, and in its carpels with usually solitary, ovoid seeds. In externals, save and except the much smaller size of the flowers, this much resembles the plant figured by Pierre under the name of *Unona Mesnyi* (Flore Forest. Coch-Chine, t. 17) to which indeed Pierre reduces *P. aberrans*.

22. POLYALTHIA BULLATA, King n. sp. A shrub 6 to 8 feet high: young branches densely covered with long soft spreading golden hairs. *Leaves* thinly coriaceous, bullate (at least when dry), narrowly oblong, acuminate, narrowed but slightly to the deeply cordate auricled base: both surfaces boldly reticulate, the upper shining, glabrous except the sulcate puberulous midrib; the lower glabrescent except the midrib and nerves which have sparse hairs like those on the young branches: main nerves 25 to 40 pairs, spreading towards the base, sub-ascending towards the apex, forming a double series of arches within the margin, bold and prominent on the lower, depressed on the upper, surface: secondary nerves and reticulations prominent; length 12 to 14 in., breadth 2·75 to 3·35 in.; petiole ·25 in, pubescent like the young branches. *Flowers* solitary, terminal or axillary, 1 in. long; pedicels slender, 1 in. long, pubescent, bracteole small, mesial. *Sepals* small, lanceolate, spreading, free, sparsely pubescent outside, glabrescent inside, about ·25 in. long. *Petals* narrowly linear, slightly wider at the base, subequal, sub-concave, sparsely pubescent. *Stamens* numerous, the apical process of the connective sub-convex, orbicular, slightly granular. *Ovaries* much fewer than the stamens, oblong, pubescent; the stigma sub-capitate-truncate, puberulous. *Ripe carpels* globular-ovoid, blunt at each end, puberulous, ·4 in. long; stalks slender, ·2 in. long. *Seeds* 2, plano-convex, the testa rugose, pale: the albumen horny.

Singapore: Ridley. Perak; King's Collector.

Evidently a rare shrub; readily recognisable by its elongate very bullate leaves.

23. POLYALTHIA SUB-CORDATA, Blume Fl. Javae, 71 t. 33 and 36 B. A shrub or small tree: young branches sparsely hispid-pubescent, afterwards glabrous and furrowed, not pale. *Leaves* membranous, sub-sessile, oblanceolate-oblong or elliptic-oblong, shortly and obtusely caudate-acuminate; the base slightly narrowed, sub-cordate, auriculate at one side; both surfaces glabrous except the sometimes puberulous midrib: main nerves 9 to 12 pairs, slender, the reticulations lax and faint: length 4·5 to 9 in., breadth 1·6 to 3 in.; petiole ·05 in., pubescent. *Flowers*

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about 1 in. in diam., solitary, axillary or extra-axillary; peduncles slender, ·5 to ·75 in. long, puberulous and with 1 or 2 lanceolate bracteoles. *Sepals* ovate, sub-acute; united into a cup. *Petals* coriaceous, yellowish, oblong, sub-acute, the inner rather smaller, slightly pubescent outside. *Carpels* numerous, broadly ovoid, not apiculate, furrowed, glabrous, ·4 in. long; stalks slender, ·25 in. long; pericarp thin. Miq. Fl. Ind. Bat. I, Pt. 2, p. 44; Ann. Mus. Ludg. Bat. II, 14. *Unona subcordata*, Bl. Bijdr. 15.

Perak; elev. about 800 feet, King's Collector, No. 2373. Distrib. Java.

24. POLYALTHIA OBLONGA, King, n. sp. A shrub or small tree 10 to 15 feet high: young branches at first rufous-tomentose, afterwards glabrous, pale and furrowed. *Leaves* thinly coriaceous, sub-sessile, oblong or oblong-oblanceolate, abruptly and shortly acuminate, narrowed to the minutely cordate, unequal base; upper surface glabrous, except the pubescent midrib; lower puberulous, the midrib prominent as are the 14 to 20 pairs of little curving, sub-ascending, main nerves; reticulations open and distinct; length 9 to 14 in, breadth 3·5 to 5 in.; petiole ·15 in., tomentose. *Flowers* 1·25 to 1·75 in. in diam., solitary, axillary or extra-axillary, from small tubercles: pedicels 1·25 to 2·5 in. long, puberulous and with 2 lanceolate bracteoles near the base. *Sepals* semi-orbicular, acute, very short, united into a cup, pubescent outside. *Petals* coriaceous, yellow, subequal, oblong, tapering to the sub-acute apex, minutely adpressed-pubescent on both surfaces but especially on the outer, length ·75 to 1·15 in. *Ripe carpels* 10 to 20, ovoid to orbicular, apiculate, ·3 to ·35 in. long, pubescent or sub-glabrous; stalks slender, ·6 to ·75 in. long. *Seeds* usually solitary and ovoid, or sometimes two and plano-convex.

Perak: very common at elevations of from 1,000 to 2,500 feet.

This plant closely resembles *Guatteria* (= *Polyalthia*) *elliptica* Blume: but its leaves have more numerous nerves and its carpels are stalked, those of *P elliptica* (according both to Blume's description and figure) being sessile and of larger size.

25. POLYALTHIA BECCARII, King n. sp. A tree 15 to 40 feet high: young branches slender, rufous-tomentose; the older coarsely striate and lenticellate. *Leaves* thickly membranous, narrowly oblong or oblong-lanceolate, acuminate, slightly narrowed to the rounded base; both surfaces shining and reticulate, the midrib pubescent on the upper tomentose on the lower; main nerves 6 or 7 pairs, slender, spreading, forming bold arches far from the edge, the secondary nerves distinct; length 3 to 4·5 in., breadth ·75 to 1·35 in.; petiole ·1 in., tomentose. *Flowers* 1 in. long, in fascicles from bracteolate tubercles on the older



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branches, their pedicels slender, pubescent, minutely bracteolate near the base, about 1 in. long. *Sepals* ovate-obtuse, ·15 in. long, pubescent outside. *Petals* coriaceous, dark-yellow, sub-equal, linear-oblong, sub-acute, 1 in. to 1·5 in. long and from ·1 to ·2 in. broad, minutely pubescent especially outside. *Ovaries* pubescent, 2-ovuled. *Ripe carpels* numerous, broadly ovoid, apiculate, glabrous, sub-granular when ripe, ·35 in. long; their stalks granular, puberulous, ·6 to ·75 in long.

Perak: at low elevations. Scortechini, King's Collector, Wray. Distrib. Sumatra; Beccari P. S., No. 401. Borneo; Motley No. 743.

The leaves of this species, although smaller, have much the same venation as those of *P. Teysmannii*, King. The carpels of this are, however, very much smaller than those of *P. Teysmannii*.

26. POLYALTHIA CINNAMOMEA, Hook. fil. and Thoms. Fl. Ind. 138; Hook fil. Fl. Br. Ind. I, 65. A tree 50 to 70 feet high; young branches rusty-tomentose. *Leaves* thinly coriaceous, narrowly oblong to oblanceolate, tapering to each end, acute or shortly acuminate, the base rounded; upper surface glabrous, shining; the lower sparsely lucid-pubescent, (glabrescent when old), the midrib tomentose; main nerves about 12 or 14 pairs, slender, curved, ascending, inter-arching freely; length 4·5 to 7·5 in., breadth 1·25 to 2·25 in.; petiole ·2 in., tomentose. *Flowers* sub-sessile, solitary, or in pairs from short woody tubercles from the young branches below the leaves, dull red, 2 to 2·25 in. long; peduncles very short, rusty-tomentose, bracteolate at the base. *Sepals* spreading, sub-orbicular, ·25 in. long, tomentose. *Petals* sub-equal, thick, linear-oblong, sub-acute, slightly narrowed at the base, adpressed-pubescent externally, glabrous within, 2 to 3 in. long. *Anthers* numerous, short, compressed; connective with broad, flat, apical, truncate process. *Pistils* oblong, pubescent; stigma large, sub-truncate. *Torus* convex, tomentose. *Fruit* globose, 2·5 in. in diam.; the individual carpels pyriform with very short stalks, ·75 to 1 in. long and ·5 to ·75 in. in diam., densely rusty-tomentose; pericarp thick. *Seeds* 2, plano-convex, with scaly testa, Miq. Fl. Ind. Bat. I, Pt. 2, p. 44. *Guatteria cinnamomea*, Wall. Cat. 6444. *G. multinervis*, Wall. Cat. 6445. *Unona cauliflora*, H. f. and Th. Fl. Ind., 137; Fl. Br. Ind. 2, 60. Miq. Fl. Ind. Bat. I, Pt. 2, 43.

Singapore; Wallich, Ridley. Penang; Wallich, Curtis No. 2470. Malacca, Maingay (Kew Distrib.) No. 37.

Apparently not a common species. Maingay's specimens from Malacca have rather larger and smoother leaves than those from Singapore and Penang.

27. POLYALTHIA PACHYPHYLLA, King, n. sp. A tree 50 to 100 feet high; young branches softly pubescent, afterwards glabrous and furrowed. *Leaves* rigidly coriaceous, elliptic-oblong, sub-acute; the edge

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slightly recurved, the base broad and rounded, or narrowed and sub-acute; both surfaces glabrous; the lower slightly paler, the midrib tomentose at the base beneath; main nerves 11 or 12 pairs, spreading, prominent, evanescent at the tips; length 4·5 to 7·5 in., breadth 1·75 to 3·5 in., petiole ·35 to ·5 in., tomentose when young. *Flowers* about 1·5 in. long, in few-flowered fascicles from small tubercles on the older branches; their pedicels 2 in. long, bracteolate about the middle, softly tawny-tomentose. *Sepals* broadly half-orbicular, very short, reflexed, tomentose. *Petals* coriaceous, nerved, pale green, oblong-lanceolate or oblanceolate, sub-acute or obtuse, pubescent on the outer, tomentose on the inner, surface; the outer slightly shorter and narrower than the inner, from ·9 to 1·5 in. long and ·3 to ·5 in. broad. *Stamens* numerous, compressed, the apical process of connective truncate; anthers linear, dorsal. *Ovaries* numerous, glabrous, vertically striate; stigma sessile, truncate, puberulous. *Ripe carpels* numerous, crowded when young, densely covered with minute pale tomentum; when ripe narrowly obovoid, blunt, narrowed to a short stalk, sub-tomentose, 1·75 in. long and about 1 in. in diam.; pericarp thick, fleshy; seeds two, plano-convex.

In its leaves this resembles *Guatteria pondok*, Miq. (Fl. Ind. Bat. Suppl. 380), but that species has carpels with stalks from 2 to 3 in. long.

Perak; at elevation under 1,000 feet, King's Collector, Nos. 6655 and 7516.

28. Polyalthia pycnantha, King. A tree? Young branches rather stout, covered with soft yellowish pubescence. *Leaves* coriaceous, elliptic-oblong, or oblong-lanceolate, obtusely acuminate, the base obtuse or rounded: upper surface glabrous; lower paler and puberulous on the midrib; main nerves arching, prominent; length 6 to 9 in., breadth 2·5 to 3·5 in.; petiole ·2 in., pubescent. *Flowers* ·5 to ·75 in. in diam., in fascicles from tubercles on the larger branches, 1 to ·5 in. in diam.; flower-peduncles ·25 in. long, pubescent, ebracteate. *Sepals* ovate, acute, ·2 in. long. *Petals* linear, obtuse, flat, sub-equal, the bases of the inner three concave, ·5 to ·75 in. long, pale sericeous outside, glabrescent inside. *Torus* columnar-flat-topped, glabrous: ovules 2, superposed. *Unona pycnantha*, Hook fil. in Fl. Br. Ind. I, 60.

Malacca; Maingay.

### 12. Anaxagorea, St. Hilaire.

Trees or shrubs. *Leaves* with pellucid dots. *Flowers* small, greenish, leaf-opposed. *Sepals* 3, valvate, connate at the base. *Petals* 6 or 3, sub-equal, 2-seriate, valvate, the inner row sometimes absent. *Torus* convex.

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***Stamens*** indefinite; anther-cells extrorse or sublateral; connective with a terminal process. *Ovaries* few, style variable; ovules 2, sub-basal, collateral, ascending. *Ripe carpels* follicular; stalk clavate. *Seeds* 1–2, exarillate, testa shining.—Distrib. Tropical Asia and America; species about 8.

Petals 6 ..... 1 *A. luzonensis*
„ 3 ..... 2 *A. Scortechinii.*

1. ANAXAGOREA LUZONENSIS, A. Gray Bot. U. S. Expl. Exped. 27. A shrub; all parts glabrous. *Leaves* membranous, oblong or elliptic-oblong, shortly acuminate, the base cuneate, the under surface pale; main nerves 7 or 8 pairs, spreading, slightly prominent beneath, the reticulations wide, rather distinct; length 5 to 7 in., breadth 1·75 to 2·5 in., petiole ·25 to 35 in. *Flowers* about ·5 in. long, solitary; pedicels ·25 in. long (twice as long in fruit), with 1 or 2 amplexicaul bracteoles. *Sepals* small, ovate-rotund, obtuse. *Petals* subequal, elliptic, obtuse, thin, nerved, white. *Ovaries* few. *Ripe carpels* 1 to 3, cuneate-clavate, somewhat compressed, narrowed into a long stalk, 1 to 2-seeded. *Seeds* plano-convex, obovate, black, shining. Hook. fil. Fl. Br. Ind. I, 68. Kurz F. Flora Burm. I, 39. *A. zeylanica*, H. f. and Th. Fl. Ind. 144: Thwaites Enum. 10; Miq. Fl. Ind. Bat. I, Pt. 2, 49; Beddome Ic. Pl. Ind. Or. t. 46. *Rhopalocarpus fruticosus*, Teysm. and Binn. in Miq. Ann. Mus. Lugd. Bat. II, 22 t. 2 fig. B. *Anaxagorea fruticosa*, Scheff. in Nat. Tijdsch. Ned. Ind. XXXI, 9.

Burmah; The Andaman Islands; Malacca; Ceylon. Distrib. Philippines, Cambodia, Sumatra.

2. ANAXAGOREA SCORTECHINII, King, n. sp. A bush or small tree: all parts, except the flower, glabrous; the young branches sub-rugulose, 2-ridged. *Leaves* thinly coriaceous, elliptic-oblong or elliptic-obovate, shortly and abruptly acuminate, slightly narrowed to the rounded or sub-acute base; main nerves 7 to 9 pairs, rather prominent beneath, the reticulations open and distinct: length 6 to 8 in., breadth 2·5 to 3·5 in.; petiole ·3 to ·4 in. *Flowers* ·75 in. long, solitary; pedicels ·3 in. (much longer in fruit) with 1 or 2 amplexicaul bracteoles. *Sepals* membranous, their edges thin, broadly ovate, acute, pubescent outside. *Petals* in a single row, much larger than the sepals, oblong-lanceolate, sub-acute, scurfy-pubescent outside, glabrous within, very fleshy, slightly concave at the base. *Stamens* numerous, those next the pistils barren, elongate and bent over the pistils. *Ovaries* numerous, obovoid, pubescent: styles curved. *Carpels* as in *A. luzonensis*, but two or three times as numerous. *Seeds* obovoid, concavo-convex, compressed, black, shining.

Perak: at low elevations; Scortechini, King's Collector, Wray.

I have altered the diagnosis of this genus as regards the petals to

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admit this species in which the inner whorl of petals is absent. In other respects the species agrees perfectly with the original diagnosis. Teysmann and Binnindyk's mono-specific genus *Rhopalocarpus* (Miq. Ann. Mus. Lugd. Bat. II, 22, t. 2 fig. B.) is an unmistakable *Anaxagorea* in which the inner petals are narrow and incurved. It is probably near *A. luzonensis.* A. Gray, and *A. javanica*, Bl. (See Benth. and Hook fil. Gen. Plant. I, 957).

### 13. Disepalum, Hook. fil.

Trees or shrubs. *Sepals* 2, large, concave, valvate. *Petals* 4, narrowly linear-spathulate, incurved, inserted remotely from each other on the margin of the very broad, sub-concave torus. *Stamens* numerous; the apical process of the connective broadly orbicular, sub-convex. *Pistils* 10 to 15 or numerous, ovoid; style short, terete; stigma small, terminal; ovule solitary. *Leaves* minutely pellucid-punctate. *Flowers* in long terminal peduncles, solitary or in pairs. Distrib. Three species, all Malayan.

1. Disepalum longipes, King, n. sp. A glabrous tree 30 to 40 feet high; young branches slender, pale brown. *Leaves* minutely pellucid-punctate, membranous, oblong, sometimes slightly oblanceolate, rarely oblong-elliptic, abruptly and shortly acuminate, the base cuneate; main nerves 7 to 10 pairs, spreading, (sub-horizontal) very faint; length 4 to 7 in., breadth 1·5 to 2·25 in., petiole ·25 in. *Flowers* on long pedicels, dark red, solitary or in pairs. terminal, ·5 in. in diam.; pedicels slender, ebracteolate, 1·25 to 2 in. long. *Sepals* reflexed, concave, broadly ovate, blunt. *Petals* remote from each other, linear-spathulate, sub-incurved, ·2 in. long. *Stamens* numerous; apical process of the connective orbicular, sub-convex. *Ovaries* numerous, stalked, slightly obovoid, glabrescent or sparsely pubescent, 1-ovuled; style short, straight; stigma small, terminal. *Immature carpels* ovoid, sub-glabrous, slightly corrugated; pericarp fleshy, fragrant. *Seed* solitary, ovoid.

Johore; on Gunong Pauti at 1,500 feet; King's Collector, No. 231. Distrib. Borneo, Beccari (P. B. 1645).

The genus *Disepalum* was founded by Sir Joseph Hooker on a Bornean shrub collected by Lobb, and the only species known to its founder was that described and figured under the name of *D. anomalum* in the Linnæan Transactions (Vol. XXIII, 156, t. 20 A.) The characters which separate the genus from any other in the family are the dimerous symmetry of the sepals and petals, and the small size of the latter, which originate at some distance from each other from the edge of the broad sub-concave torus. The species here described differs from *D. anomalum* in its arboreous habit, larger leaves, and much more numerous

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ovaries, which are moreover nearly glabrous and have long stalks. Quite ripe fruit is as yet unknown.

### 14. Goniothalamus, Blume.

Small trees or shrubs. *Leaves* with small nerves, forming intramarginal loops. *Flowers* solitary or fascicled, axillary or extra-axillary; peduncles with basal, scaly, distichous bracts. *Sepals* 3, valvate. *Petals* 6, valvate in 2 series; outer thick, flat or nearly so; inner smaller, shortly clawed, cohering in a vaulted cap over the stamens and ovary. *Stamens* many, linear-oblong; anther-cells remote, dorsal; connective produced into an oblong or truncate process. *Ovaries* many; style simple or 2-fid; ovules solitary or 2, superposed, sub-basal (4 in *G. uvarioides*.) *Ripe carpels* 1-seeded.—Distrib. About 47 species, natives of Eastern tropical Asia and its islands.

The plants referred to this genus are, by Baillon, treated as part of *Melodorum*.

Ovules 1 or 2.

| | | |
|---|---|---|
| Style cylindric, slender; stigma subulate, entire ... ... ... | 1. | *G. subevenius.* |
| Style very short; stigma funnel-shaped, slit on one side, its edges toothed ... | 2. | *G. tenuifolius.* |
| Style cylindric; stigma truncate, entire. | | |
| Flowers in fascicles from the stem only; ripe carpels 1·25 in. long ... | 3. | *G. Prainianus.* |
| Flowers solitary from the axils of the leaves or fallen leaves; ripe carpels ·4 in. long ... ... ... | 4. | *G. Kunstleri.* |
| Style subulate or cylindric; stigma deeply 2-cleft, petals 3 to 5 in. long ... ... | 5. | *G. giganteus.* |
| Style cylindric; stigma unequally 2-toothed | 6. | *G. malayanus.* |
| Style cylindric; stigma minutely and equally 2-toothed. | | |
| Flowers axillary or from the axils of fallen leaves; outer petals more than 1 in. long. | | |
| Anthers with slightly convex, orbicular apical appendages ... | 7. | *G. fulvus.* |
| Anthers with very pointed, conical apical appendages. | | |
| Nerves of leaves 28 to 34 pairs | 8. | *G. Curtisii.* |
| Nerves of leaves fewer than 20 pairs. | | |

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| | | |
|---|---|---|
| Leaves shining, reticulate, glabrous; ripe carpels oblong, ·5 to ·6 in. long | 9. | *G. Griffithii.* |
| Leaves glabrous, opaque, dull, not reticulate; ripe carpels globular-obovoid; ·4 in. long. ... | 10. | *G. macrophyllus.* |
| Flowers in fascicles from tubercles near the base of the stem ... ... | 11. | *G. Ridleyi.* |
| Style cylindric; stigma 3-toothed; apices of anthers acuminate. | | |
| Leaves thickly coriaceous; nerves inconspicuous ... ... ... | 12. | *G. Tapis.* |
| Leaves strongly and prominently nerved. | | |
| Sepals large, orbicular-ovate, obtuse, ·65 to 1 in. long ... | 13. | *G. Scortechinii.* |
| Sepals small, ovate acuminate, ·2 in. long ... ... ... | 14. | *G. Wrayi.* |
| Ovules and seeds 4 ... ... ... | 15. | *G. uvarioides.* |

1. GONIOTHALAMUS SUBEVENIUS, King, n. sp. A shrub or small tree; young branches slender, puberulous; otherwise glabrous except the flower. *Leaves* membranous, narrowly oblong, tapering at each end; upper surface shining, pale-greenish when dry; the lower paler, dull; main nerves 10 to 12 pairs, sub-horizontal, invisible or very faint on either side; length 3·5 to 6·5 in., breadth 1·25 to 1·75 in., petiole ·2 in. *Flowers* solitary, axillary, ·75 to ·9 in. long; pedicels ·4 to ·6 in. long, ebracteate. *Sepals* broadly ovate, bluntly acuminate, 3-nerved, minutely pubescent on both surfaces, ·3 in. long. *Petals* thinly coriaceous, puberulous except towards the base inside, lanceolate, sub-acute; the inner petals half as large as the outer, slightly clawed. *Stamens* with broad orbicular sub-convex apical process. *Ovaries* narrowly oblong, style cylindric, curved; stigma subulate, entire. *Ripe carpels* ovoid to oblong, obtuse, tapering very little at the base, glabrous, ·5 to ·75 in.; stalks ·35 to ·45 in.

Perak; at low elevations, King's Collector.

2. GONIOTHALAMUS TENUIFOLIUS, King, n. sp. A shrub 6 to 8 feet high; glabrous except the petals; young branches slender, dark-coloured, striate. *Leaves* thinly membranous, lanceolate, or oblong-lanceolate, shortly acuminate, the base acute; main nerves 8 to 11 pairs, spreading, inter-arching within the minutely undulate margin, faint on both surfaces; length 4·5 to 7 in., breadth 1 to 1·75 in., petiole ·2 in. *Flowers* axillary, solitary, drooping; pedicels slender, bi-bracteolate at the base,

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·35 to ·45 in. long. *Sepals* free, large, membranous, green, many-nerved and reticulate, broadly ovate, acute or acuminate, glabrous, ·75 to 1·1 in. long. *Petals* whitish, thinly coriaceous, faintly nerved, broadly lanceolate, acuminate, much contracted at the base, pubescent, 1 to 1·2 in. long, (smaller in var. *aborescens*); inner petals less than half as long, ovate, acuminate, the base contracted, pubescent. *Anthers* numerous, compressed, the apices broad, flat, pubescent. *Ovaries* few, narrow, short, 1 rarely 2-ovuled; the style long, straight, thickened upwards; stigma hollowed like a funnel, the edges toothed. *Ripe carpels* partly enveloped by the persistent calyx, ovoid, very slightly apiculate, puberulous or glabrescent, ·4 to ·5 in. long; stalks ·2 in long. *Seeds* usually 1, rarely 2.

Perak; at a low elevations, King's Collector, No. 3019; Wray, Nos. 3379, 3558.

Var. *aborescens*, King; a small tree 15 to 25 feet high; *leaves* 4 to 4·5 in. long; petals coriaceous, adpressed-pubescent, about half as long as in the typical form; *sepals* only ·3 in. long.

Perak; elevations from 2,000 to 3,000 feet, King's Collector.

This possibly ought to be considered a distinct species; but as its anthers and ovaries are exactly the same as in the typical shrubby *G. tenuifolius*, I prefer to consider it a mountain form of that species. Both the typical form and the variety have remarkable stigmas, shaped like funnels and with toothed edges.

3. Goniothalamus Prainianus, King, n. sp. A tree 50 to 70 feet high: young branches rather slender, pale; all parts, except the inflorescence, glabrous. *Leaves* membranous, oblong-oblanceolate to elliptic-oblong, abruptly shortly and bluntly acuminate, the base slightly cuneate; main nerves 14 to 18 pairs, oblique, inter-arching within the margin, prominent beneath; length 7 to 11 in., breadth 2·25 to 2·8 in., petiole ·35 in. *Flowers* 1·25 to 1·5 in. in diam., on long pedicels from large, woody, puberulous tubercles at the base of the stem: pedicels 2 to 4 in. long with two minute bracteoles at the base. *Sepals* coriaceous, united so as to form a spreading cup with three broad sub-acute triangular teeth, puberulous outside, glabrous inside. *Petals* thickly coriaceous, pale yellow; the outer row large, obovate-rotund, concave, incurved, (ovate-oblong in var.) pubescent on both surfaces, nearly 1 in. long: inner row much smaller, clawed. *Stamens* numerous, the connective prolonged into a blunt, conical, puberulous, apical process. *Ovaries* narrowly oblong, glabrous; style cylindric, not lobed, truncate. *Ripe carpels* obovoid, slightly apiculate, tapering to the base, glabrous, 1 to 1·25 in. long; stalks ·25 in. long. *Seed* solitary, smooth.

Perak; King's Collector, Wray; at low elevations.

Var.: *angustipetala*, King; petals oblong-ovate, sub-acute.

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Perak: King's Collector.

A species collected by Forbes in Eastern Sumatra (Herb. Forbes, No. 3172) resembles this closely. The specimens are in fruit only, and the individual carpels being a little smaller and less obovoid, it probably belongs to a distinct species. Forbes' specimens have no flowers.

4. GONIOTHALAMUS KUNSTLERI, King. A shrub 4 to 10 feet high: young branches minutely rufous-tomentose, the older pale, glabrous and much striate. *Leaves* thinly membranous, oblanceolate to elliptic-oblanceolate, abruptly and bluntly acuminate, the base cuneate; both surfaces pale-brown when dry, minutely pellucid-punctate, glabrous; the midrib alone puberulous on the upper; main nerves 11 to 13 pairs, spreading, curved and inter-arching boldly a little within the margin, slightly prominent on the under surface: length 6 to 9 in., breadth 2 to 3·25 in.; petiole ·35 in. puberulous. *Flowers* solitary, slightly supra-axillary; pedicels ·15 in. long. *Sepals* green, thinly membranous, puberulous, nerved and reticulate, broadly ovate, acute, spreading, very slightly cuneate at the base, ·3 to ·4 in. long. *Petals* sub-coriaceous, yellow or orange-coloured; the outer lanceolate, acuminate, slightly narrowed at the base, puberulous outside, ·8 to 1·25 in. long: inner petals about one-third as long, ovate, acute, pubescent. *Anthers* many, short, compressed, the tops broad, flat, pubescent. *Ovaries* about as long as the stamens, narrowly cylindric; style long, straight, thick: stigma notched. *Ripe carpels* crowded, broadly ovoid, slightly apiculate, ·4 in. long.

Perak; at Goping, King's Collector, Scortechini, Wray.

Var. *marcantha*, King; leaves narrowly elliptic or oblong, bluntly acuminate, puberulous beneath; outer petals 1·25 to 1·5 in. long.

Penang and Province Wellesley: Curtis.

5. GONIOTHALAMUS GIGANTEUS, Hook. fil. and Thoms. Fl. Ind., 109. A tree 30 to 70 feet high; young branches very pale, glabrous. *Leaves* coriaceous, oblong, shortly acuminate, the base cuneate, the edges slightly recurved (when dry); upper surface shining, glabrous: the lower dull, puberulous, the midrib very prominent: main nerves 10 to 14 pairs, very slender, spreading, more conspicuous above than below: length 6 to 10 in., breadth 2·25 to 2·75 in.; petiole ·25 in., deeply channelled. *Flowers* very large, from the axils of fallen leaves and from the younger branches; peduncles recurved, 1 in., or more, long (elongated in the fruit), pubescent. *Sepals* ovate, acute, pubescent outside, spreading or recurved, about 5 in long. *Petals* very coriaceous, yellowish tinged with green; the outer broadly ovate to ovate-oblong, with a dark thick triangular spot at the base, 3 to 5 in. long, minutely pubescent; the inner only about ·6 in. long, ovate-acute, densely golden sericeous.



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*Anthers* very numerous, their apices convex. *Ovaries* hairy, 2-ovuled: style long, slender, much curved; stigma 2-lobed. *Ripe carpels* oblong, apiculate, tapering much to the stalk, minutely granular and with obscure vertical ridges when dry, 1·25 to 1·5 in. long and ·6 in. in diam.: stalks ·75 in., stout. *Seeds* 1 or 2, oblong, slightly compressed, the testa brown. Hook. fil. Fl. Br. Ind. I, 75: Miq. Fl. Ind. Bat. I, pt. 2, 28. *Uvaria gigantea*, Wall. Cat. 6469 A. B. (*in part*). *Anonacea* Griff. Icon. Plant. t. 652?

Singapore; Wallich, Ridley, Hullett. Penang; Curtis. Perak; King's Collector.

6. GONIOTHALAMUS MALAYANUS, Hook. fil. and Thoms. Fl. Ind 107. A small glabrous tree, 15 to 20 feet high; bark of branches very pale. *Leaves* coriaceous, oblong to elliptic-oblong, shortly and abruptly acuminate, the base slightly cuneate, rarely rounded, the edges recurved; upper surface shining, the lower dull, darker (when dry); main nerves 12 to 15 pairs, sub-horizontal, faint; length 5·5 to 9 in., breadth 1·5 to 2·75 in.; petiole ·25 in., deeply channelled. *Flowers* slightly supra-axillary, solitary, greenish; pedicels ·35 to ·5 in., pubescent, bracteolate at the base. *Sepals* ovate-triangular, acuminate, pubescent, connate at the base, persistent, ·25 in. long. *Petals* coriaceous, the outer broadly ovate, acuminate to ovate-lanceolate, minutely tomentose on both surfaces, with a triangular glabrous basal spot, keeled outside, 1 to 1·25 in. long; the inner about a third as long, ovate, acuminate, sericeous or tomentose. *Anthers* numerous. *Pistils* about 15, the ovary hairy, ovules 3 to 4; style long, slender, much bent outwards; stigma sub-capitate, unequally 2-lobed. *Ripe carpels* narrowly oblong apiculate, tapering to each end, glabrous, 1·5 in. long, and ·5 in. in diam; stalks ·1 in., thick. *Seeds* 2 or 3, flattened-ovoid, nearly black. Hook. fil. Fl. Br. Ind. I, 75; Miq. Fl. Ind. Bat. I, Pt. 2, 28. *Goniothalamus Slingerlandtii*, Scheff. Tijdsch. Ned. Ind. XXXI, 341. *Uvaria* sp. Griff. Notul. IV, 710.

Malacca; Griffith, Maingay (Kew Distrib.) No. 63. Perak; common. Distrib. Bangka.

7. GONIOTHALAMUS FULVUS, Hook. fil. and Thoms. Fl. Br. Ind. I, 75. A shrub: young branches slender, dark-coloured, at first rufous-pubescent, afterwards glabrous. *Leaves* membranous, pellucid-dotted, oblong-oblanceolate, obtuse or with a short broad point; upper surface glabrous, the lower puberulous; main nerves 14 to 16 pairs, slightly prominent beneath, spreading; length 7 to 10 in., breadth 2·5 to 3·25 in.; petiole ·3 in., pubescent. *Flowers* solitary, axillary, pedicels ·25 in., puberulous. *Sepals* broadly ovate, obtuse, pubescent, connate at the base, ·25 in. long. *Petals* coriaceous, densely sericeous, the outer oblong-

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lanceolate, attenuate to the apex, slightly keeled outside, 1 to 1·25 in. long; inner about ·3 in. long, ovate, acute. *Stamens* numerous, apices of anthers very convex, puberulous. *Ovaries* oblong, pubescent; style cylindric, glabrous: stigma bifid. *Fruit* unknown.

Malacca; Griffith.

Known only by Griffith's imperfect specimens.

8. Goniothalamus Curtisii, King, n. sp. A shrub or small slender tree: young branches densely rusty-tomentose, the larger pale and glabrous. *Leaves* stoutly membranous, narrowly oblong to obovate-oblong, more or less abruptly and shortly acuminate, slightly narrowed to the rounded base; upper surface shining, glabrous except the puberulous midrib; the lower sparsely puberulous, the midrib and nerves dark rusty-tomentose; the latter 28 to 34 pairs, sub-horizontal, inter-arching near the margin, very prominent, as is the midrib, on the lower and depressed on the upper surface: length 9 to 15 in., breadth 3 to 5·5 in.; petiole ·35, channelled, pubescent. *Flowers* solitary, from the stem; pedicels stout, decurved, with two deciduous bracteoles at the base, ·6 in long. *Sepals* large, green, rigidly membranous, conjoined into a cup with 3 broadly-ovate, sub-acute teeth, boldly nerved and reticulate, minutely rufous-pubescent, persistent; length from ·75 to 1 inch. *Petals* coriaceous, velvety-tomentose, yellowish, tinged with red: the outer broadly lanceolate, acuminate, slightly narrowed and thickened at the base, from 1 25 to 1·75 in. long; the inner rather more than one-third as long, ovate, acuminate. *Anthers* numerous, compressed, linear, with acute granular conical apices. *Ovaries* numerous, narrowly elongate, densely pubescent, 1-ovuled; style straight; stigma oblique, minutely lobed. *Ripe carpels* obliquely ovoid with long pointed, slightly hooked apices, rufous-pubescent, ·75 in. long: stalks only ·1 in. long, stout.

Selangor; Curtis, Nos. 310 and 2316. Perak; King's Collector, No. 10548: Scortechini, No. 660.

A very distinct species.

9. Goniothalamus Griffithii, Hook. fil. and Th. Fl. Ind., 110. A large shrub or small tree; all parts glabrous except the ovaries and carpels: young branches dark-coloured. *Leaves* coriaceous, oblong, sub-acute, or shortly and obtusely acuminate, the base cuneate; both surfaces shining and reticulate; main nerves 12 to 20 pairs, faint, spreading, inter-arching within the edge: length 7 to 12 in, breadth 1·8 to 3·5 in.; petiole ·25 to ·5 in., thick. *Flowers* solitary, axillary or extra-axillary; pedicel ·5 to 1 in. long with a few scale-like bracteoles near the base. *Sepals* thinly coriaceous, orbicular-ovate, blunt, connate below, nerved and reticulate, persistent, ·5 to ·75 in. long. *Petals* thickly coriaceous;

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the outer broadly lanceolate, acuminate, 1·5 to 2·5 in. long: the inner ovate, acute, ·6 to ·8 in long. *Anthers* with an acute apical process. *Ovaries* strigose: style long, subulate; stigma slightly bifid. *Ripe carpels* sub-sessile, oblong, ·5 or ·6 in. long, glabrescent or glabrous. Hook. fil Fl. Br. Ind. I, 73; Kurz F. Flora Burma, I, 42.

Burmah: Mergui, Griffith. Moulmein, Falconer.

10. GONIOTHALAMUS MACROPHYLLUS, H. f. and Th. Fl. Ind. I, 74. A glabrous shrub 5 to 15 feet high; young branches very stout, dark-coloured. *Leaves* coriaceous, large, oblong-lanceolate to oblong-oblanceolate, acute or shortly acuminate, slightly narrowed to the sub-acute or rounded base; main nerves 16 to 20 pairs, spreading, impressed above and slightly prominent beneath; length 10 to 18 in., breadth 2·5 to 4·5 in.; petiole ·6 to 1 in., very stout. *Flowers* slightly supra-axillary or from the branches below the leaves, solitary or in pairs, green; pedicels ·35 in. long, sub-clavate. *Sepals* broadly ovate, acute, connate at the base, ·65 in., long, slightly puberulous, tinged with purple. *Petals* coriaceous, the outer oblong-lanceolate, acute or acuminate, 1 to 1·5 in. long; the inner half as long, ovate, acuminate, the edges ciliate. *Stamens* numerous, linear. *Ovaries* 12 to 18, glabrous, 1-ovuled; style slender, dilated above, stigma 2-lobed. *Ripe carpels* globular-obovoid, slightly apiculate, glabrous, ·4 in. long, *Seed* pale brown. Miq. Fl. Ind. Bat. I, Pt. 2, 28: Ann. Mus. Lugd. Bat. II, 38. *Polyalthia macrophylla*, Blume Fl. Jav. Ann. 79 t. 39. *Unona macrophylla*, Blume Bijdr, I, 17.

It is possible that two species may be included here, there being some difference between the specimens in the nervation of the leaves.

Malacca; Griffith, Maingay, (Kew Distrib.) No. 62. Perak, King's Collector. Penang; Curtis. Kedah; Curtis. Distrib. Sumatra, Forbes, 1370.

11. GONIOTHALAMUS RIDLEYI, King, n. sp. A tree: young branches slender, puberulous. *Leaves* membranous, broadly elliptic, shortly and abruptly acuminate, the base sub-acute, pale when dry; both surfaces reticulate; the upper dull, glabrous, except the puberulous midrib and nerves, the lower shining, puberulous on the midrib, nerves and reticulations; main nerves about 6 pairs, curving, ascending; length about 8 in.; breadth 4·5 in.; petiole ·25 in., puberulous. *Flowers* 1·75 to 2 in. long, in fascicles on long pedicels from warted, puberulous, woody tubercles on the stem: pedicels 2·5 to 3·5 in. long, minutely bracteolate at the base. *Sepals* coriaceous, broadly ovate-elliptic, obtuse, nerved, ·6 in. long, free, spreading, puberulous. *Petals* coriaceous, pale brown; the outer elliptic-oblong to ovate, obtuse or sub-acute, with a broad thickened claw, puberulous, 1·65 to 2 in. long; inner row a little longer than the sepals, obovate, apiculate, with narrow claw. *Stamens* numerous,

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long, narrow, much compressed; the apical process of the connective small, sub-conic. *Ovaries* oblong, narrow; style cylindric, puberulous; stigma 2-lobed. *Ripe carpels* obvoid-globular, tapering slightly to the short stalk, glabrous, about 1 in. long.

Singapore; at Sunga Murai, Ridley.

It is possible that in the above description the size of the leaves may be understated, as the only one which I have seen may not be of average size.

12. GONIOTHALAMUS TAPIS, Miq. Fl. Ind. Bat. Suppl. 371. A tree 15 to 40 feet high; all parts, except the flowers, glabrous; young branches pale brown. *Leaves* coriaceous, oblong, abruptly shortly and bluntly acuminate, the base rounded or slightly cuneate, the edges recurved (when dry); both surfaces dull, brown when dry, the lower paler; main nerves 10 to 12 pairs, thin, spreading, very indistinct, the midrib prominent beneath; length 5·5 to 9 in., breadth 2·5 to 3·25 in., petiole ·3 in. *Flowers* solitary and supra-axillary, or in fascicles from tubercles on the branches; pedicels curved, ·4 in. long, bracteolate at the base. *Sepals* free, ovate, acute, spreading, pubescent, persistent, ·4 in. long. *Petals* coriaceous, puberulous; the outer ovate-lanceolate, acuminate, contracted and thickened at the base, 1·75 in. long; the inner ovate, acute, much contracted and thickened at the base, ·65 in. long. *Anthers* numerous and with conical apices. *Ovaries* narrow, hairy; style straight; ovules solitary, *Stigma* sub-discoid-capitate, 2- to 3-lobed. *Ripe carpels* crowded, obovoid, smooth, sub-sessile, ·4 to ·5 in. long. Miq Ann. Mus. Lugd. Bat. II, 35.

Perak; at low elevations, very common; Scortechini, Wray, King's Collector. Penang and Pangkore; Curtis. Distrib. Sumatra, Borneo.

13. GONIOTHALAMUS SCORTECHINII, King, n. sp. A shrub or small tree, glabrous, except the flowers; young branches with rather pale striate bark. *Leaves* membranous, oblanceolate or oblong-oblanceolate, very shortly acuminate, narrowed from the above the middle to the acute or sub-acute base; when dry the upper surface greenish, the lower pale brown; main nerves 18 to 24 pairs, spreading and inter-arching near the edges, slender, slightly prominent beneath; length 10 to 15 in., breadth 2·75 to 4 in., petiole ·3 in. *Flowers* solitary, rarely in pairs, from the branches below the leaves; pedicels clavate, decurved, bi-bracteolate at the base, ·5 in. long. *Sepals* rigidly membranous, large, orbicular-ovate, obtuse or sub-acute, much nerved and reticulate, connate below, persistent, from ·65 to 1 in. long (according to age). *Petals* coriaceous, rusty-puberulous; the outer oblong-lanceolate, sub-oblique, not much longer than the full grown sepals; the inner broadly ovate, acute, about ·5 in. long. *Anthers* numerous, narrow, with elongate, conical apical pro-

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cesses. *Ovaries* narrow, puberulous, 1-ovuled: style straight; stigma 2- or 3-lobed. *Ripe carpels* crowded, ovoid-oblong, apiculate, glabrous, narrowed to the short stalks, ·45 in. long; stalks ·2 to ·25 in. *Seed* smooth, pale.

Perak; at low elevations; Scortechini, Wray, King's Collector.

The leaves of this species much resemble those of *Polyalthia oblonga*, King.

14. Goniothalamus Wrayi, King, n. sp. A shrub 3 to 12 feet high, glabrous, except the flowers: young branches slender, very pale. *Leaves* membranous, oblanceolate to lanceolate or oblong, shortly and bluntly acuminate, the base cuneate: both surfaces pale (when dry), obscurely reticulate: main nerves 14 to 18 pairs, spreading, straight, slender and very slightly prominent even when dry: length 4·5 to 9 in., breadth 1·25 to 2 in., petiole ·2 to ·25 in. *Flowers* solitary, slightly supra-axillary; pedicels slender, decurved, minutely bracteolate, ·35 in. (elongated to ·75 in. in fruit). *Sepals* membranous, slightly nerved and reticulate, ovate, acuminate, spreading or recurved, puberulous outside, ·2 in. long, persistent. *Petals* sub-coriaceous, greenish-yellow, puberulous: the outer narrowly lanceolate, acuminate, the bases thickened and not narrowed to a claw, ·65 to ·75 in. long: inner petals about half as long, ovate-acuminate. *Anthers* numerous, half as long as the ovaries, compressed, their apices with a long thin point from a broad base. *Ovaries* about 20, narrowly cylindric, hairy like the stout, straight style 1- to 2-ovuled: stigma truncate. *Ripe carpels* narrowly obovoid to oblong, apiculate, gradually tapering to the stalk, glabrous, ·6 in. long. *Seeds* usually 1, rarely 2, oblong.

Perak: at low elevations very common; Wray, Scortechini, King's Collector.

15. Goniothalamus uvarioides, King, n. sp. A shrub 6 to 15 feet high: all parts glabrous except the flower and fruit; young branches pale. *Leaves* thinly coriaceous, oblong, slightly obovate, slightly narrowed to the minutely cordate base: both surfaces rather dull when dry, the lower pale brown, the edges slightly recurved; main nerves 22 to 25 pairs, spreading, rather straight, inter-arching near the margin; length 10 to 15 in., breadth 3 to 6 in.; petiole ·4 in., stout, channelled. *Flowers* on the trunk, (solitary?); pedicels curved, stout, ·35 in. long. *Sepals* coriaceous, semi-orbicular, blunt, pubescent, 2 in. long. *Petals* very coriaceous, yellow: the outer broadly lanceolate, thickened and truncate at the base, rufous-pubescent, 1·5 in. long: inner petals like the outer but with contracted bases and only 1 to 1·2 in. long. *Anthers* with conical apices. *Ovaries* hairy; style cylindric; stigma small, truncate, minutely bifid. *Ripe carpels* oblong, tapering to each end, puberulous,

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1·5 in. long, and ·65 in. in diam.; stalks ·7 in. long. *Seeds* 4, compressed, rugose, ·5 in. long.

Perak: Ulu Slim, King's Collector, No. 10664. Ulu Bubong, King's Collector, No. 10126. Distrib., Borneo; Motley, No. 960.

Motley's Bornean specimen above-quoted is in flower only; but it so entirely resembles in leaves and wood those of my collector in Perak which are in fruit only, that I have ventured not only to consider them as belonging to the same species, but to draw up the above description of the flowers from the Bornean and of the fruit from the Perakian specimens. The species resembles *G. fulvus* in leaves and flower and *G. malayanus* in flower. The fruit is more like that of a *Uvaria* than of a *Goniothalamus*, having 4, sub-horizontal, rugose seeds.

### 15. Orophea, Blume.

Trees or shrubs. *Flowers* usually small, axillary, solitary, fascicled or cymose. *Sepals* 3, valvate. *Petals* 6, valvate in 2 series; outer ovate; inner clawed, usually cohering by their margins into a mitriform cap; sometimes oblong and slightly approximate below the middle, the apices divergent not vaulted: rarely without claws and in one species slightly imbricate. *Stamens* definite, 6–12, ovoid, fleshy; anther-cells dorsal, large, contiguous, the connective sometimes prolonged into a conical apical point, not truncate. *Staminodes* 0, or 3 to 6. *Ovaries* 3–15; style short or 0; ovules 4. *Ripe carpels* 1- or more-seeded, globular or oblong (very long in several species.)—Distrib. Species about 25; all Eastern Asiatic.

Intermediate between *Mitrephora* and *Bocagea*, having the perianth of the former and stamens of the latter.

Inner petals distinctly vaulted, the limbs coherent by their edges.
- Stamens 12 ... ... ... 1. *O. setosa.*
- Stamens 6.
  - Leaves glabrous at all ages (see also No. 5) 2. *O. Katschallica.*
  - Leaves more or less pubescent (except No. 5).
    - Carpels globose when ripe ... 3. *O. hirsuta.*
    - Carpels oblong when ripe.
      - Carpels under 2 in. in length ... 4. *O. hexandra.*
      - Carpels 3 to 5 in. long.
        - Leaves quite glabrous, main nerves 6 or 7 pairs ... 5. *O. enterocarpa.*
        - Leaves puberulous beneath, main nerves 10 or 12 pairs 6. *O. maculata.*

Inner petals slightly vaulted, trapezoid ... 7. *O. gracilis.*

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Inner petals spreading, not vaulted and not trapezoid.

Stamens 10 or 12.

Inner petals hastate; ripe carpels globular 8. *O. hastata.*

Inner petals linear-oblong, the apices divergent and recurved; ripe carpels ovoid or slightly obovoid ... ... 9. *O. dodecandra.*

Stamens 6.

Inner petals cuneiform or cuneiform-retuse; ripe carpels cylindric ... ... 10. *O. cuneiformis.*

Inner petals irregularly oblong, their apices broad and curved outwards, ripe carpels globular ... ... 11. *O. polycarpa.*

1. Orophea setosa, King, n. sp. A shrub: young branches densely covered with a layer of minute pubescence with numerous, long, brownish, straight bristles projecting beyond it; the older branches dark-coloured and almost glabrous. *Leaves* membranous, oblong or oblong-oblanceolate, shortly acuminate, the base rounded: main nerves 8 to 10 pairs, oblique, inter-arching near the edge; both surfaces sparsely setose, more densely so on the midrib and nerves, the lower also with sparse, minute pubescence; length 5·5 to 7·5 in., breadth 2 to 2·75 in., petiole ·05 in., setose. *Flowers* solitary, extra-axillary, about ·2 in. in diam. when expanded: pedicels very slender, ·75 in. long, pubescent, with a single minute bracteole below the middle. *Sepals* sub-orbicular, blunt. *Outer petals* much larger than the sepals, broadly ovate, subacute, pubescent outside and glabrous inside like the sepals. *Inner petals* longer than the outer, vaulted, ·22 in. long, the limb trapezoid-sagittate, pubescent on the back and edges, glabrous in front; the claw narrow, shorter than the limb. *Male flower* stamens numerous, cuneate, the connective broadly truncate at the apex. *Ovaries* unknown. *Ripe carpels* 4 or 5, sessile, globose or oblong-globose, ·3 in. in diam., densely and minutely pubescent and with a few long setæ besides. *Seeds* solitary, rarely 2; the testa pale, rather rough; the albumen very dense.

Perak: at elevations from 800 to 1,200 feet; King's Collector, Scortechini.

2. Orophea Katschallica, Kurz in Trimen's Journ. Bot. 1875, p. 323. A small tree 25 to 30 feet high: young branches slightly puberulous at first, ultimately glabrous, black and furrowed. *Leaves* membranous, oblong-lanceolate to oblong or elliptic, shortly and bluntly acuminate, the base sub-cuneate or rounded; upper surface glabrous, shining; the lower much reticulate, slightly adpressed-puberlous; main nerves 3 to 10 pairs, ascending, slender; length 4 to 7 in., breadth

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1·5 to 2·75 in., petiole ·15 in. *Peduncles* extra-axillary, solitary, ·5 to ·75 in. long, with numerous ovate-acuminate, rusty-pubescent bracts. *Flowers* 1 to 4, rather large; their pedicels about ·4 in. long, pubescent and with a single adpressed ovate-lanceolate bracteole. *Sepals* ovate-acuminate, adpressed-pubescent outside, sub-glabrescent inside. *Outer petals* much larger than the sepals, ovate-orbicular, acute, veined, pubescent on the outer surface and on the upper half of the inner, ·4 in. long. *Inner petals* ·75 in. long, trapezoid, acute, tomentose on both surfaces except a glabrous patch bearing a transverse callosity on the inner; the claw long, narrow and glabrous. *Stamens* 6 perfect, with a few imperfect in an outer row: anther-cells large, dorsal; the connective oblique, slightly produced above their apices. *Ovaries* about 3, narrowly ovoid, densely sericeous, 3-ovuled; stigmas sessile, truncate. *Fruit* unknown.

Nicobar Islands; Kurz, King's Collector.

3. Orophea hirsuta, King, n. sp. A shrub 8 to 12 feet high: young branches at first densely rufous-hirsute, afterwards becoming glabrous and dark-coloured. *Leaves* elliptic or elliptic-oblong, often slightly obovate, shortly and bluntly acuminate, narrowed from below the middle to the rounded minutely cordate base: upper surface glabrous, shining, the lower pale, dull, sparsely hirsute, the midrib setose at the base: main nerves 8 to 9 pairs, spreading, very faint: length 3·5 to 4·5 in., breadth 1·24 to 1·75 in.; petiole ·05, setose. *Peduncles* extra-axillary, about ·5 in. long, 1- to 3-flowered, rufous-hirsute like the pedicels: pedicels about ·75 in. long and with several minute bracteoles. *Flowers* ·5 in. in diam. *Sepals* broadly ovate, acute, coarsely hirsute outside and on the edges, glabrous inside. *Outer petals* much larger than the sepals, broadly obovate, blunt, sparsely pubescent outside and on the edges, glabrous inside, ·15 in. long. *Inner petals* ·25 in. long, vaulted: the limb trapeziform, rather thick, glabrous outside, pubescent inside; the claw very narrow, longer than the limb, glabrous. *Stamens* 6, in a single row, curved: anthers broad, dorsal, the connective not produced above their apices. *Ovaries* about 6, ovoid, glabrous, 1- to 2-ovuled: stigma sessile, roundish. *Carpels* 4 to 5, globular, yellow when ripe, sparsely hirsute, ·4 in. in diam.; stalks ·1 in.

Perak: King's Collector, No. 4283.

Only once collected. In its leaves this resembles *Mitrephora setosa*. King.

4. Orophea hexandra, Blume Bijdr. 18. A small tree: young branches slender, minutely tomentose, soon becoming dark-coloured, glabrous and furrowed. *Leaves* thinly coriaceous, oblong-lanceolate to elliptic-oblong, rather abruptly acuminate, the base sub-cuneate or



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rounded; upper surface glabrous, shining; the lower reticulate, puberulous, the midrib pubescent; main nerves 7 to 9 pairs, oblique: length 4·5 to 6 in., breadth 1·5 to 2·25 in., petiole ·2 in. *Peduncles* axillary or supra-axillary, slender, 1- to 3-flowered, pubescent; bracts several, subulate, hairy. *Flowers* about ·35 in. long, greenish-white. *Sepals* minute, ovate to ovate-lanceolate, densely pubescent outside. *Outer petals* thin, ovate-cordate, acuminate, pubescent; the inner larger, trapezoid with long narrow claw, glabrous with pubescent margins. *Stamens* 6, in one row. *Ovaries* about 6, pubescent, 2-ovuled. *Ripe carpels* oblong, subsessile, acuminate, minutely adpressed-pubescent, 1·4 to 1·75 in. long. *Seeds* usually solitary, sometimes ·2 in. long, narrowly cylindric. Kurz For. Flora Burma, I, 49: Miq. Fl. Ind. Bat. I, pt. 2 p. 29. *O. acuminata*, A. D C. in Mem, Soc. Genev. V, 39; Hook. fil. and Thoms. Fl. Ind. 112; Hook. fil. Fl. Br. Ind. I, 91; Wall. Cat. 6432. *Bocagea hexandra*, Blume Fl. Jav. Anon. 83 t. 40.

Burma prov. Tenasserim, Wallich. Great Coco Island; Kurz. S. Andaman; King's Collectors.

Pierre (Flore Forestiere Cochin-Chine t. 44) figures a species called *O. Thorelii* which, as he remarks, must be closely allied to this.

5. Orophea enterocarpa, Maingay ex Hook. fil. Fl. Br. India, I, 92. A small tree 15 to 30 feet high; all parts, except the inflorescence, glabrous: young branches slender, black, striate. *Leaves* membranous, ovate or sometimes obovate-lanceolate to elliptic, acuminate (sometimes abruptly so); the base rounded, sometimes sub-cuneate; both surfaces shining: main nerves 6 or 7 pairs, spreading, slender: length 2·5 to 5 in., breadth 1·2 to 2 in., petiole ·1 in. *Flowers* nodding, solitary, extra-axillary: the pedicels very slender, ·75 to 1·25 in. long, glabrous below, pubescent above and with several ovate-lanceolate bracteoles. *Sepals* small, broadly ovate, acuminate, pubescent. *Outer petals* much larger than the sepals, ovate, acuminate, puberulous, the inner a little longer (·6 to ·75 in. long); the limb elongated-trapezoid, puberulous; the claw narrow and glabrous, yellowish with a reddish band; staminodes 6. *Stamens* 6, with broad connective, not apiculate. *Ovaries* 6, cylindric, glabrous, 2- to 7-ovuled; stigma small, sessile. *Carpels* 4 to 6, elongate-cylindric, glabrous, moniliform when dry, 3 to 5 in. long and ·3 in. in diam. *Seeds* 2 to 7, linear-oblong.

Malacca: Maingay. Perak; Scortechini, King's Collector.

6. Orophea maculata, Scortechini MSS. A shrub or small tree: young branches slender, rusty-tomentose at first, afterwards glabrous, black and striate. *Leaves* membranous, elliptic-oblanceolate, caudate-acuminate, narrowed from below the middle to the rounded or sub-cuneate slightly unequal base: upper surface glabrous, the lower

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glabrescent, the midrib and nerves pubescent; main nerves 10 to 12 pairs, spreading, rather faint; length 3·25 to 7 in., breadth 1·5 to 2·25 in., tomentose. *Peduncles* solitary, 1- to 3-flowered, extra-axillary, very slender, ·5 to 1 in. long, pubescent, with numerous, distichous, sub-deciduous, linear-lanceolate, pubescent bracts. *Flowers* large, sub-pendulous. *Sepals* narrowly lanceolate, acuminate. *Outer* petals larger than the sepals, mottled red and yellow, ovate, very acuminate, veined, pubescent on both sides, ·5 in. long. *Inner petals* 1 in. long, with lanceolate, much acuminate, very pubescent limb; the claw long, narrow, pubescent. *Stamens* 6, broad, not apiculate, hairy at the base. *Staminodes* 3, orbicular. *Ovaries* 3 to 6, cylindric, very hirsute, 6- or 7-ovuled: stigma sessile. *Carpels* 4 to 6, much elongate, cylindric, puberulous, 3 to 5 in. long, and about ·3 in. in diam., moniliform when dry. *Seeds* 4 to 7, linear-oblong.

Perak; Scortechini, King's Collector.

7. Orophea gracilis, King, n. sp. A tree 20 to 30 feet high; young branches slender, at first minutely tomentose, afterwards darkly cinereous and glabrous. *Leaves* thinly coriaceous when adult, lanceolate, much acuminate, the base cuneate or slightly rounded, both surfaces glabrous: main nerves 5 or 6 pairs, spreading, inter-arching far from the edge, very indistinct; length 2·5 to 3·5 in., breadth ·9 to 1·2 in, petiole ·05 in. *Flowers* solitary, ·25 in. in diam., extra-axillary; pedicels ·75 to 1 in. long, very thin, glabrous, jointed, and with several minute, subulate bracteoles above the middle. *Sepals* broadly ovate, sub-acute, connate at the base, spreading or reflexed. *Outer petals* larger than the sepals, ovate, acute, ·15 in. long; both surfaces glabrous, the edges alone minutely pubescent. *Inner petals* ·25 in. long, slightly vaulted; the limb thick, trapezoid, with pubescent edges; the claw narrow, not so long as the limb, glabrous. *Stamens* 6, in a single row, the connective much produced above the rather small dorsal anther-cells. *Ovaries* 4 to 10, ovoid, glabrous, 2-ovuled: stigma large, sessile. *Ripe carpels* 6 to 10, globular, glabrous, ·45 in. in diam., their stalks ·25 in. long. *Seeds* solitary or two together, depressed-globose, with a transverse groove and ridge, shining, pale.

Perak: Scortechini, King's Collector.

This is closely allied to the W. Peninsular *O. uniflora*, but that species has twice as many stamens.

8. Orophea hastata, King, n. sp. A tree 20 to 40 feet high: all parts glabrous except the inflorescence: young branches rather slender, dark-coloured. *Leaves* thinly coriaceous, elliptic to elliptic-oblong, shortly caudate-acuminate; the base cuneate, rarely rounded; both surfaces shining, the lower pale: main nerves 6 to 8 pairs, spreading,

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inter-arching within the edge; length 3·5 to 5·5 in., breadth 1·6 to 2·4 in., petiole ·2 in. *Peduncles* axillary or supra-axillary, solitary, about ·25 in. long, bearing towards the apex 3 or 4 1-bracteolate, pubescent pedicels. *Flowers* ·4 in. long. *Sepals* broadly ovate, acute, pubescent, outside, glabrous inside as are the outer petals. *Outer petals* twice as large as the sepals, broadly ovate acute. *Inner petals* ·35 in. long; the limb hastate, triquetrous, thickened, the edges and the base ciliate; the claw long, narrowed to the base, glabrous. *Staminodes* 0. *Stamens* 10, in 2 rows, curved, slightly apiculate; the anther-cells large. *Ovaries* about 10, obliquely oblong, curved, pubescent, 2-ovuled; stigma small, capitate, sessile. *Ripe carpels* 5 or 6, globular, glabrous, ·4 in. in diam., their stalks about ·25 in. *Seeds* solitary.

Perak: Wray, King's Collector, at low elevations.

This is closely allied to *O. dodecandra*, Miq.

9. Orophea dodecandra, Miq. in Ann. Mus. Lugd. Bat. II, 25. A tree 20 to 40 feet high; young branches sparsely adpressed-pubescent, afterward glabrous dark-coloured and striate. *Leaves* membranous, elliptic, rarely elliptic-oblong, slightly unequilateral, shortly caudate-acuminate, the base cuneate; upper surface glabrous, shining, the lower paler with a few scattered, pale, adpressed hairs; main nerves 5 or 6 pairs, bold beneath, inter-arching ·25 in. from the margin; length 3·5 to 5·5 in.; breadth 1·75 to 2·3 in., petiole ·2 in. stout, channelled. *Peduncles* supra-axillary, longer than the pedicels, 3- to 7-flowered, glabrous; pedicels ·5 in. long, clustered near the apex, bracteolate above the middle. *Flowers* ·5 in. long. *Sepals* smaller than the outer petals, spreading, dotted, conjoined at the base, slightly tubercular outside, glabrous inside. *Outer petals* broadly ovate, acuminate, narrowed at the base, ·15 in. long. *Inner petals* thick, linear-oblong, blunt, puberulous outside, slightly arched below the middle, the apices divergent and recurved. *Staminodes* 0. *Stamens* 12, in 2 rows; the connective rather narrow, prolonged beyond the apices of the large, broad, dorsal anthers. *Ovaries* 6 to 8, oblong, curved, oblique, glabrous, 2-ovuled; stigma oblong, sessile. *Ripe carpels* ovoid or slightly obovoid, blunt, glabrous, ·85 in. long; their stalks ·8 to ·9 in. *Seed* solitary, sub-rotund or oblong, with rugose, pale, scaly testa.

Perak; Scortechini, King's Collector; at low elevations.

10. Orophea cuneiformis, King, n. sp. A tree 20 to 40 feet high; young parts rusty-pubescent or tomentose; the branchlets rather stout; ultimately glabrous, dark-coloured and furrowed. *Leaves* thinly coriaceous, oblong, narrowly elliptic or oblanceolate-oblong, more or less sharply acuminate, very little narrowed to the rounded or minutely cordate base; upper surface at first with many long, thin, pale,

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adpressed hairs, ultimately glabrous; lower softly but rather coarsely pubescent, the midrib and 8 to 12 pairs of oblique, rather prominent main nerves rufous-tomentose; length 3·5 to 6 in., breadth 1·1 to 2·2 in.; petiole ·05, tomentose. *Peduncles* 4- or 5-flowered, solitary, supra-axillary, slender, sub-glabrous below, rufous-sericeous above, longer than the pedicels; bracts numerous, linear-lanceolate; pedicels ·3 in. long, rufous-sericeous like the outer surface of the sepals and outer petals, bracteolate at the base. Flower buds globose. *Sepals* ovate, much acuminate, glabrescent inside like the outer petals. *Outer petals* ovate, acute, veined. *Inner petals* with a cuneiform, sometimes retuse, thick limb and a short, narrow claw. *Staminodes* 3, in an outer row, sub-orbicular, fleshy. *Stamens* 6, with broad flat connective, not produced at the apex, and large dorsal anthers. *Ovaries* about 6, oblong, oblique, densely villous, 2- or 3-ovuled, *Stigma* sessile, broad. *Ripe carpels* 2 to 4, sessile, cylindric, tapering a little at each end, puberulous, 1·5 to 1·75 in. long and about ·35 in. in diam. *Seeds* 2, oblong.

Perak; Scortechini, King's Collector.

This is readily distinguished from the closely allied species *O. maculata*, by its scorpioid cymes, globular flower-buds, and by the cuneiform (not lanceolate) limbs of its petals.

11. Orophea polycarpa, A. DC. in Mem. Soc. Genev. V, 39. A large shrub or small tree: young branches slender, pubescent at first, but speedily glabrous, furrowed and dark-coloured. *Leaves* membranous, ovate to ovate-oblong, obtusely and very shortly acuminate, the margins undulate, the base rounded or narrowed; both surfaces glabrous; main nerves 6 to 8 pairs, spreading, faint; length 2 to 4 in., breadth 1 to 1·75 in., petiole ·05 in. *Peduncles* axillary or supra-axillary, slender, 1- to 3-flowered, pubescent; bracteoles several. *Sepals* ovate, acute, very pubescent. *Outer petals* ovate, acuminate, more than twice as large as the sepals, pubescent on the outer, glabrous on the inner, surface. *Inner petals* twice as long as the outer, irregularly oblong, the apices broad and curved outwards, the base slightly narrowed, puberulous outside, glabrous within, ·4 in. long. *Stamens* 6 or 7 in a single row; the anther-cells quite dorsal, separate, the connective flat and very slightly prolonged above their apices. *Ovaries* about twice as many as the stamens, glabrous, ovate, oblique: stigma small, sessile, sub-capitate. *Ripe carpels* globular, glabrous, shining, ·35 in. in diam.: their stalks ·25 in. long. *Seeds* 1 or 2. Hook. fil. and Thoms. Fl. Ind. 111; Hook. fil. Fl. Br. Ind. I, 91; Kurz F. Flora Burma, I, 49; *Anonacea* Griff. Ic. Pl. Ind. Or. IV, t. 654. Wall. Cat. 6431. *Bocagea polycarpa*, Steud. Nomen. 212. *Melodorum? monospermum* Kurz in Andaman Report, App. B. p. 1. *Bocagea polycarpa*, Steud.

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S. Andaman; Kurz, King. Burmah: Martaban, Wallich.

*Orophea undulata*, (Pierre Fl. Forest. Coch.-Chine t. 45) must be closely allied to this, as must also the same author's *O. anceps*, (l. c. t. 46).

### 16. Mitrephora, Blume.

Trees. *Leaves* coriaceous, strongly ribbed, plaited in vernation. *Flowers* usually terminal or leaf-opposed, sometimes 1-sexual. *Sepals* 3, orbicular or ovate. *Petals* 6, 2-seriate, valvate; outer ovate, thin, veined; inner clawed, vaulted and cohering. *Stamens* oblong-cuneate; the anther-cells dorsal, remote, the connective broadly truncate at the apex. *Ovaries* oblong; style oblong or clavate, ventrally furrowed; ovules 4 or more, 2-seriate. *Ripe carpels* globose or ovoid, stalked or sub-sessile.—Distrib. Species about 10; tropical Asiatic.

| | |
|---|---|
| Flowers hermaphrodite ... ... ... | 1. *M. Maingayi.* |
| Flowers unisexual. | |
| Ripe carpels ovoid, apiculate, rugulose ... | 2. *M. reticulata.* |
| „ „ globular, not apiculate, not rugulose | 3. *M. macrophylla.* |
| „ „ sub-globular, sub-truncate at each end, rugulose ... ... | 4. *M. Prainii.* |

1. Mitrephora Maingayi, Hook. fil. and Thoms. Fl. Br. Ind. 1, 77. A tree 20 to 50 feet high: young branches softly rufous-tomentose afterwards glabrous dark-coloured and striate. *Leaves* coriaceous, oblong to ovate, (oblong-lanceolate in var. *Kurzii*), acute or shortly and bluntly acuminate, the base rounded or sub-cuneate; upper surface shining, glabrous except the pubescent midrib; under surface glabrescent, the midrib and nerves thinly adpressed-pubescent; (pubescent in var. *Kurzii*); main nerves 6 to 10 pairs, oblique, curving, slightly prominent beneath: length 3 to 5·5 in., breadth 1·5 to 2 in., petiole ·3 to ·4 in. *Flowers* 1 in. or more in diam., axillary or leaf-opposed, solitary or 2 or 3 in a multi-bracteolate and tomentose raceme; pedicels ·5 to 1·5 in. (lengthening with age), bracteolate. *Sepals* connate into a cup, broadly ovate, acute, (or obtuse in var.) tomentose. *Petals* rather thinly pale yellow mottled with red, all more or less pubescent outside, the outer orbicular or obovate with undulate erose edges, slightly narrowed at the base, (oblong in var. *Kurzii*); inner shorter, the outer very pubescent inside, vaulted, ovate or cordate with a long linear claw. *Anthers* numerous, short, with broad flat smooth tops. *Ovaries* gradually narrowed into the short style; ovules 4; stigma sub-capitate-discoid. *Ripe carpels* broadly ovoid, blunt at each end, densely tomentose, 1 in. long, and ·75 in. in diam.: their stalks stout, ·75 in. *Seeds* 4, compressed. *M. Teysmannii*, Scheff. in Flora LII (1869), 302. *Uvaria obtusa* (not of

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Blume), Hook. fil. and Thoms., Fl. Ind. 113; Hook. fil. Fl. Br. Ind. I, 76; Wall. Cat. 6484.

Penang; Wallich, Curtis. Pangkore; Curtis. Malacca; Maingay, (Kew Distrib.) No. 65. Perak: King's Collector, Scortechini, Wray. Burma, Kurz. Distrib. Java.

Var. *Kurzii*, Leaves oblong-lanceolate, acuminate to elliptic: peduncles of racemes woody, 1 in. or more long, tomentose; outer petals narrowly oblong. *M. vandaeflora*, Kurz F. Flora Burma I, 45.

Burma; Kurz, Brandis.

Allied to the Cambodian species *M. Thorellii*, (Pierre Fl. Forest. Cochin-Chine, t. 37).

2. MITREPHORA RETICULATA, Hook. fil. and Thoms. Fl. Br. Ind. I, 77. A tree 20 to 30 feet high: young branches tawny-tomentose, ultimately glabrous and dark-coloured. *Leaves* narrowly oblong, often slightly obovate, acuminate, the base cuneate or rounded; both surfaces shining, reticulate, glabrous; the midrib puberulous on the upper, sparsely setose on the lower, surface; main nerves 12 to 14 pairs, spreading, prominent, distinct beneath; length 5 to 14 in., breadth 2 to 4·5 in.; petiole ·25 in., swollen. *Flowers* ·2 in. in diam., axillary, solitary or in pairs, or in few-flowered, puberulous cymes; pedicels long, slender, with many lanceolate bracteoles. *Flowers* as in *M. macrophylla*, monœcious. *Ripe carpels* ovoid, apiculate, rugose, hoary, ·8 in. long and ·65 in diam. *Seeds* 2.

Kurz F. Flora Burma, I, 44. *Orophea reticulata*, Miq. Ann. Mus. Lugd. Bat. II, 23. *Uvaria reticulata*, Blume Fl. Jav. Anon. 50, t. 20. *Pseuduvaria reticulata*, Miq. Fl. Ind. Bat. i. pt. 2, 30.

Burma: prov. Tenasserim; Helfer. Malacca; Maingay (Kew Distrib.), No. 64. Perak: Wray, King's Collector, Scortechini; not so common as *M. macrophylla*, Oliver.

This species has the inner petals rather larger than the outer and much vaulted; and in this respect it conforms to the characters of *Orophea;* but its stamens are uvarioid in character and they are numerous; its flowers, moreover, are unisexual. The characters of *Mitrephora* therefore preponderate, and it is better located in the latter genus. But there is no doubt it forms a connecting link between the two genera.

3. MITREPHORA MACROPHYLLA, Oliver in Hook., Ic. Plant, t. 1562. A small tree; young branches more or less puberulous, speedily becoming glabrous and cinereous. *Leaves* thinly coriaceous, elliptic-obovate or oblong-oblanceolate, acute or shortly acuminate; the base rounded, slightly oblique; both surfaces puberulous at first but speedily glabrous, shining, minutely reticulate; main nerves 14 to 20 pairs, oblique, inter-arching ·15 in. from the margin, prominent beneath; length 7 to 13

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in., breadth 1·75 to 4 in.; petiole ·25 in., swollen. *Flowers* ·25 to ·3 in. in diam., axillary, usually in pairs, or in cymes, 1 to 2 in. long, the cymes minutely pubescent; bracts few, lanceolate; pedicels long, with several broadly lanceolate, partly deciduous bracteoles, or ebracteolate. *Sepals* free, or connate below, reniform, or broadly ovate, puberulous outside and on the edges, glabrous inside. *Outer petals* larger than the sepals, orbicular-ovoid, sub-acute, slightly narrowed at the base, puberulous on both surfaces. ·15 in. long. *Inner petals* ·3 in. long, thick, vaulted reniform-sagittate, puberulous, with a glabrous callosity on the inside near the base, the edges pubescent; the claw shorter than the limb, pubescent. *Male flower: stamens* very numerous, short, cuneate; the connective truncate, small and not concealing the tops of the anthers; pistils 3, or a few rudimentary. *Female flower*; *staminodes* in two imperfect rows. *Ovaries* about 12, ovoid-cylindric, oblique, pubescent, 4-ovuled; stigmas sessile, large, fleshy, truncate, often oblique. *Ripe carpels* globose, densely and minutely tawny-tomentose, ·4 or ·5 in diam.; stalks ·2 in. long. *Seeds* several, compressed, the testa membranous.

Penang; Maingay, Curtis. Perak; Scortechini, King's Collector, Wray.

This species, although rare in Penang, is very common in Perak. Specimens of it vary considerably in several respects. In some plants the young shoots are densely puberulous, in others they are almost glabrous; the leaves also vary in size and in amount of pubescence. In the specimen figured by Professor Oliver (Hook. Ic. Pl. 1562), the flowers are in axillary pairs; but, in the majority of the Perak specimens, they are in cymes. The species is practically dicœcious, the staminate flowers having no ovaries at all or only a few rudiments; while the pistillate flowers have rarely a few perfect stamens, and not always any staminodes. The best marks of distinction between this and *M. reticulata*, of which this must be a very close ally, are the smaller number of the nerves in the leaves of this and the ovoid shape of its rugose fruit. In its leaves this plant somewhat resembles some of the species of *Popowia*. And, inasmuch as its inner petals are larger than the outer and are vaulted, it is related to *Orophea*, from which however its numerous uvarioid stamens and unisexual habit exclude it.

4. Mitrephora Prainii, King, n. sp. A tree 30 to 40 feet high; young branches tawny-pubescent, speedily becoming glabrous and dark-coloured. *Leaves* membranous, elliptic-oblong, rather abruptly and shortly acuminate, the base cuneate and often slightly unequal-sided; upper surface glabrous except the depressed, strigulose midrib; lower surface much reticulate, glabrous but with a few scattered hairs on the

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midrib and 12 to 14 pairs of rather bold, oblique, curving nerves; length 6 to 9 in., breadth 2·25 to 3 in., petiole ·25 in., pubescent. *Flowers* bisexual, from the axis of the fallen leaves, solitary, ·4 in. in diam.; pedicels about ·5 in. long, softly tomentose, minutely bracteolate at the base. *Sepals* broadly ovate, acute, concave, tomentose outside, glabrous inside. *Outer petals* much larger than the sepals, ovate-orbicular, subacute; tomentose outside, glabrous inside. *Inner petals* longer but narrower than the outer; the limb trapezoid, densely tomentose, glabrous inside at the base; the claw narrow, about as long as the limb, tomentose on both surfaces. *Stamens* in the male flower numerous, short, cuneate; the apical process of the connective truncate, concealing the apices of the dorsal anthers. *Pistils* 0. *Female flowers* unknown. *Ripe carpels* sub-globose, rather truncate at base and apex, rugulose, minutely pubescent, ·65 in. in diam. *Seeds* about 5, plano-convex, the testa membranous, rugulose.

Andaman Islands; Prain, King's Collector.

The inner petals of this species are undoubtedly longer than the outer; but they are much narrower. Technically they are the petals of *Orophea* rather than of *Mitrephora*; but the numerous Uvarioid stamens and the unisexual habit are those of the latter, to which I accordingly refer it. I have been able to examine only a few flowers of the species, and these are all tetramerous; but whether this arrangement is normal or only occasional I am unable to say until larger suites of specimens are obtained.

### 17. Popowia, Endl.

Trees. *Flowers* small, sub-globular, opening but slightly, usually hermaphrodite, sometimes polygamous, extra-axillary or leaf-opposed. *Sepals* 3, ovate, valvate. *Petals* 6, valvate in 2-series, (the inner series imbricate in *Kurzii*), more or less orbicular; outer like the sepals, spreading; inner thick, concave, connivent, acute, the tip sometimes inflexed. *Stamens* indefinite or sub-definite, short, cuneate; anther-cells dorsal, remote. *Carpels* about 6, ovoid; style large, oblong or sub-clavate, straight or recurved; ovules 1-2 on the ventral suture, rarely 1, basal, erect. *Ripe carpels* berried, globose or ovoid, stalked.—Distrib. About 20 Asiatic species, 12 Australian and 1 African. (The Australian and African species may be generically separable).

There has been considerable variety of opinion as to the place of the genus *Popowia* amongst the genera of *Anonaceæ*. The genus was founded by Endlicher (Genus No. 4710) to accommodate the species named *Bocagea pisocarpa* by Blume (Flora Javae (Anonaceæ) 90, t. 45).



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Endlicher placed it next to *Orophea* from which it is distinguished by its inner row of petals being free and having their apices inflexed in æstivation, while those of *Orophea* are clawed, vaulted, attached by their edges, and not inflexed in æstivation. In their Flora Indica, Hooker filius and Thomson added the species *P. ramosissima* to the original plant of Endlicher, with a remark to the effect that *Uvaria Vogelii* H. f. should be included in the genus. Farther they associated *Popowia* with the genera *Orophea*, *Mitrephora* and *Goniothalamus* in the tribe *Mitrephoreæ*. In their Genera Plantarum, Mr. Bentham and Sir Joseph Hooker take a different view of the position of *Popowia* and, in the arrangement adopted in that great work, *Popowia* is put amongst the *Unoneae*; *Orophea* is relegated to the tribe *Miliuseae*; while *Goniothalamus* and *Mitrephora* are retained side by side in the tribe *Mitrephoreae*. Now the character of the tribe *Unoneae* is:—"petals flat, slightly unequal, or those of the inner row smaller than those of the outer, or absent," while in several of the *Popowias*, *e. g.*, *P. pisocarpa*, *P. ramosissima* the inner petals are longer than the outer. Baillon, whose arrangement of tribes differs from that of Messrs. Bentham and Hooker, puts *Popowia* into *Unoneae*, leaving *Mitrephora* and *Orophea* side by side in his tribe *Oxymitreæ*.

Dr. Scheffer differs from the opinion of the authors of the Genera Plantarum and of Baillon and rather inclines to that of the authors of the Flora Indica. He points out with much force that the proper place for *Popowia* is in the tribe characterised by its "outer petals being open, the inner connivent over the andro-gynœcium, erecto-connivent or connate"—that is to say in the tribe *Mitrephoreæ* of these authors. The stamens of *Popowia* present considerable diversity, but on the whole they have the character of those of *Uvariae* rather than those of *Unoneae*. As Scheffer remarks, there is little difference between the genera *Orophea* and *Mitrephora* except that the outer petals of *Mitrephora* are usually larger than those of *Orophea*. And if M. Baillon's plan of reducing the number of the genera in *Anonaceae* were to be carried out, Dr. Scheffer would suggest the union of these two and of *Popowia* into a single genus, from which would be excluded, however, all the African species. Of this new genus *Orophea* would be the typical form, and the other two would form sub-genera.

There is no doubt than in externals many *Popowias* are like *Oropheas*, and the non-unguiculate character of the inner petals of *Popowia* is really the chief character which separates them.

I venture to follow Dr. Scheffer and the authors of the Flora Indica in putting *Popowia*, *Orophea and Mitrephora* together in the tribe *Mitrephoreae*.

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Flowers hermaphrodite.

Both surfaces of leaves glabrous except the nerves.

Both surfaces minutely granular; nerves 9 or 10 pairs, sparsely pilose beneath ... 1. *P. pauciflora.*

Lower surface granular, the midrib and 6 to 8 pairs of nerves pubescent ... 2. *P. ramosissima.*

Both surfaces shining, reticulate, glabrous except the tomentose midrib on the upper; nerves about 10 pairs, very faint. 3. *P. nitida.*

Upper surface of leaves glabrous, the lower minutely granular and sub-strigose; nerves 4 or 5 pairs ... ... ... 4. *P. Helferi.*

Upper surface of leaves glabrous except the puberulous midrib, the lower yellowish-tomentose; nerves 11 to 13 pairs; fruit very large ... ... ... ... 5. *P. fœtida.*

Upper surface of leaves glabrous except the tomentose midrib and 8 to 10 pairs of nerves; lower surface pubescent and sub-granular ... 6. *P. perakensis.*

Both surfaces minutely granular; upper shortly puberulous, lower pubescent; nerves 8 to 11 pairs... ... ... ... 7. *P. fusca.*

Both surfaces minutely granular; upper with a few scattered hairs; lower fuscous, densely and softly pubescent; the nerves 6 or 7 pairs, tomentose or pubescent ... ... 8. *P. velutina.*

Both surfaces, but especially the lower, softly pubescent; nerves about 10 pairs ... 9. *P. tomentosa.*

Flowers polygamous.

Upper surface of leaves glabrous except the puberulous midrib; nerves 10 or 11 pairs; flowers ·5 to ·75 in. in diam.; petals of inner row larger than those of outer, valvate, their apices inflexed in bud ... ... 10. *P. nervifolia.*

Upper surface of leaves sub-granular, minutely and sparsely adpressed-pubescent; nerves 9 to 12 pairs; flowers ·4 in. in diam.; inner petals slightly smaller than the outer, imbricate ... ... ... ... 11. *P. Kurzii.*

Both surfaces of leaves glabrous, the lower silvery, shining; nerves 7 pairs ... 12. *P. Hookeri.*

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1. Popowia pauciflora, Maingay MSS. Hook. fil. Fl. Ind. I, 69. A tree? Young branches slender, cinereous, strigose. *Leaves* membranous, elliptic-lanceolate, acuminate, the base acute; both surfaces glabrous, minutely granular; the midrib and 9 or 10 pairs of oblique, little curving main nerves sparsely pilose beneath; length 5 to 6 in., breadth 1·5 to 2 in., petiole ·2 in., pubescent. *Flowers* extra-axillary, solitary or axillary, ·25 in. in diam.; pedicels ·15 to ·25 in. long, with a basal bracteole, rusty-strigose. *Sepals* minute, ovate. *Petals;* the outer small and like the sepals; the inner three times as large, sub-orbicular, concave, their apices inflexed. *Stamens* many. *Ovaries* about 6, strigose; ovule solitary, erect. *Ripe carpels* sub-sessile, globular, glabrous.

Malacca: Maingay (Kew Distrib.) No. 56.

Known only by Maingay's imperfect specimens; an obscure species.

2. Popowia ramosissima, Hook. fil. and Thoms. Fl. Ind. 105. A small spreading tree; young branches at first rufous-pubescent; the older dark-coloured and furrowed. *Leaves* membranous, sub-sessile, narrowly elliptic to lanceolate, sometimes slightly obovate, shortly, bluntly and abruptly acuminate, the base rounded or slightly narrowed; both surfaces glabrous, the lower granular and pubescent on the midrib and 6 to 8 pairs of ascending rather straight nerves; length 2·75 to 4 in., breadth 1 to 1·75 in., petiole ·05 in. *Flowers* globular in bud, leaf-opposed, solitary or in small fascicles, ·2 in. in diam.; pedicels ·15 to ·25 in. long (longer in fruit), minutely bracteolate, rufous-tomentose. *Sepals* broadly triangular-ovate, acute, nearly as large as the outer petals and like them tomentose outside, and glabrous inside. *Petals* sub-equal, coriaceous, rotund, concave; the inner rather larger and with incurved points. *Stamens* short, with very broad truncate concave heads. *Ovaries* 5 or 6, villous; ovules 1 or 2. *Ripe carpels* globose with short stalks, pubescent, ·25 to ·35 in. in diam. Miq. Fl. Ind. Bat. I, Pt. 2, 27; Hook. fil. Fl. Br. Ind. I, 68. *Guatteria ramosissima*, Wall. Cat. 7294, 8006. *Popowia rufula* and *P. affinis* Miq. Ann. Mus. Lugd. Bat. II, 20.

In all the provinces, common. Distrib. Sumatra, Borneo.

3. Popowia nitida, King, n. sp. A shrub? Young branches sparsely and softly rufous-pubescent, the bark brown. *Leaves* thinly coriaceous, oblong-lanceolate to oblong-ovate, bluntly acuminate, the base rounded; both surfaces reticulate, glabrous and shining, the midrib tomentose on the upper; main nerves about 12 pairs, very faint, spreading and forming double arches inside the edge; length 2·5 to 4 in., breadth ·6 to 1·25 in., petiole ·1 in. *Flowers* few, in short extra-axillary racemes, sub-globular, ·25 in. in diam.; pedicels about as long as the flowers, each with 2 sub-orbicular, stem-clasping, pubescent bracteoles. *Sepals* orbicular, concave, puberulous on both surfaces, about ·15 in. in

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diam. *Petals* sub-equal, about twice as large as the sepals, orbicular-ovate, sub-acute, cordate at the base, the edges incurved. *Stamens* about 27, in three rows; anther-cells linear, lateral, the apical process of the connective obliquely truncate, papillose. *Pistils* numerous, forming a large mass with their stigmas agglutinated. *Ovaries* sub-cuneate, pubescent especially near the truncate apex; stigma very large and viscous, sessile; ovules 1 to 3, ascending. *Ripe carpels* ovoid, pointed, glabrous, ·4 to ·5 in. long. *Seeds* 1 to 3, compressed, the testa pale brown, shining.

S. Andaman: King. Nicobars: Kurz.

In its leaves this much resembles *Uvaria micrantha*, H. f. and T. as which I have reason to believe some specimens of this have been distributed from the Calcutta Herbarium.

4. Popowia Helferi, Hook. fil. and Thoms. Fl. Ind. I, 69. A small spreading tree; young branches coarsely hairy. *Leaves* membranous, lanceolate or oblong-lanceolate, acuminate, the base narrowed but rounded; upper surface glabrous; the lower granular, sub-strigose, especially on the midrib; main nerves indistinct, about 4 or 5 pairs, ascending: length 2 to 4 in., breadth ·8 to 1·25 in., petiole ·05 in. *Flowers* minute, globose, extra-axillary: peduncles ·05 to ·2 in., tomentose. *Sepals* ovate, strigose. *Outer petals* like the sepals, the inner orbicular, larger than the outer, concave, very strigose, their apices inflexed. *Stamens* 15. *Ovule* solitary. *Carpels* about 6, globular, strigose. Kurz. F. Flora Burm. I, 39.

Andamans; North of Port Mouat; Kurz. Burmah: Tenasserim, on King's Island; Helfer.

A very little known species closely resembling *P. Beddomiana*, H. f. and Th.

5. Popowia fœtida, Maingay MSS., Hook. fil. Fl. Br. Ind. I, 69. A large tree; young branches tawny-tomentose. *Leaves* sub-coriaceous, elliptic-lanceolate, shortly caudate-acuminate, the base sub-acute; upper surface glabrous except the puberulous midrib, lower densely covered with yellowish-grey tomentum as are the petioles; main nerves 11 to 18 pairs, rather prominent beneath, curved, spreading, inter-arching close to the margin; length 4·5 to 6·5 in., breadth 1·6 to 2 in., petiole ·2 in. *Flowers* solitary, ·35 in. in diam.; pedicels ·2 in., tomentose. *Sepals* minute, ovate, obtuse. *Petals* unequal, the outer ovate-elliptic, obtuse, yellow; the inner slightly larger, apiculate, concave, the margins thick. *Stamens* about 30, the connective large. *Ovaries* about 6, strigose, 2-ovuled. *Ripe carpels* few, very large, oblong-ovoid, obtuse, sessile, densely and shortly yellowish-tomentose, 2·25 in. long, and 1·5 in. in diam. *Seed* solitary, oblong, the testa bony.

Malacca; Maingay, (Kew Distrib.) No. 55.

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6. Popowia perakensis, King, n. sp. A shrub 6 to 15 feet high; young branches densely and minutely dull rusty-tomentose, the older dark and furrowed. *Leaves* elliptic to oblong-elliptic, very shortly and rather abruptly acuminate, the base slightly narrowed, sometimes sub-oblique; upper surface glabrous, the midrib and nerves tomentose; lower pubescent, sub-granular: main nerves 8 to 10 pairs, spreading, slightly prominent beneath; length 4 to 5·5 in., breadth 2 to 2·5 in.; petiole ·1 in., tomentose. *Flowers* extra-axillary, usually in pairs (but not contemporaneous) ·3 in. in diam.; pedicels ·4 in. long, ferrugineous-tomentose, minutely bracteolate. *Sepals* smaller than the petals, semi-orbicular, acute, coarsely tomentose outside, sub-glabrous inside. *Petals* thick, ovoid-orbicular, sub-acute, sub-concave, densely whitish-sericeous outside, glabrous within; the inner row slightly larger than the outer, neither their edges nor apices incurved. *Stamens* numerous, flattened, with truncate, corrugated heads. *Ovaries* about 10, thin, glabrous, except a few long hairs near the base, 2-ovuled: stigmas large, rounded. *Ripe carpels* few, ovoid, with sub-truncate apices, slightly narrowed to the stalks, glabrous or sparsely pubescent, with several horizontal constrictions when ripe ·5 in. long and ·25 in. in diam.; stalks ·25 to ·5 in. long. *Seeds* 2, superposed, plano-convex.

This resembles *P. ramosissima* in its leaves but has much larger flowers of which the inner petals are not inflexed and the carpels have 2 seeds.

Perak: King's Collector, Wray; from 200 to 2,500 feet.

7. Popowia fusca, King, n. sp. A tree 40 to 50 feet high; young branches densely covered with purplish-brown tomentum; the older cinerous, sub-pubescent and much furrowed. *Leaves* coriaceous, oval-oblong, obtuse or sub-acute, the base rounded; both surfaces minutely granular, the upper shortly puberulous, the lower pubescent, the midrib and 8 to 11 pairs of spreading, rather prominent main nerves tomentose on both; length 2·5 to 3·5 in., breadth 1·4 to 1·8 in.; petiole ·2 in. purplish-tomentose like the flower pedicels. *Flowers* in small extra-axillary fascicles from small bracteate tubercles, 25 in. in diam.; pedicels ·15 to ·25 in. *Sepals* ovate-obtuse, tomentose outside, glabrous inside. *Petals* sub-equal, rotund, very thick and fleshy, tomentose outside, puberulous inside. *Ripe carpels* few, globular, densely tomentose, ·25 in. in diam.; stalks ·1 to ·2 in. long, tomentose. *Seeds* solitary.

Perak, near Ulu Kerling, at an elevation of 500 feet, King's Collector, No. 8602.

This much resembles *P. velutina*, King, but its leaves are more oval, have more nerves, and are not so pubescent.

8. Popowia velutina, King, n. sp. A tree 20 to 40 feet high;

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young branches covered with minute soft deep brown tomentum. *Leaves* elliptic-oblong, to ovate-elliptic, acute or shortly and narrowly acuminate, slightly narrowed to the rounded sub-unequal base; both surfaces minutely granular, the upper with a few scattered hairs; the lower fuscous and more densely and softly pubescent, both the midrib and nerves tomentose or pubescent; main nerves 6 or 7 pairs, spreading, indistinct; length 3 to 5 in., breadth 1·4 to 1·8 in., petiole ·1 in. *Flowers* solitary or in pairs, extra-axillary, about ·25 in. in diam., pedicels densely tomentose, ·35 in. long, bracteolate. *Sepals* broadly ovate, sub-acute, densely tomentose outside, glabrous inside, persistent in the fruit. *Petals* sub-equal, thick, sub-orbicular, very tomentose outside, glabrous inside. *Ripe carpels* few, sometimes solitary, ovoid, blunt, slightly oblique at the base and slightly narrowed to the stalk, minutely velvety-pubescent, ·5 in. long and ·35 in. in diam.; stalks ·2 in., tomentose; torus small. *Seed* solitary, glabrous, rugose, vertically furrowed.

Perak, at Kinta; at elevations under 1,000 feet; King's Collector.

A species very like *P. fusca*, but with shorter, fewer-nerved leaves; evidently not common. None of the collectors' specimens have fully developed flowers, and the foregoing description of these is taken from a bud.

9. Popowia tomentosa, Maingay MSS. Hook. fil. Fl. Br. Ind. I, 70. A tree; young branches softly rusty-tomentose, when older black and rugose. *Leaves* elliptic-oblong to elliptic, acute or shortly acuminate, the base rounded, slightly unequal-sided; both surfaces, but especially the lower, softly pubescent; main nerves about 10 pairs, slightly prominent, spreading; length 4·5 to 5·5 in., breadth 1·75 to 3 in.; petiole ·1 in., tomentose. *Flowers* extra-axillary, sub-sessile, ·25 in. in diam. *Sepals* broadly ovate, connate, slightly smaller than the petals. *Petals* slightly unequal, villous outside, glabrous inside; the outer ovate, thick; the the inner larger, very thick and concave, oblong, connivent. *Stamens* about 25. *Ovaries* 7 to 9, oblong, pubescent; ovules 2. *Ripe carpels* globose, slightly pubescent, ·5 to ·74 in. in diam., 2-seeded; their stalks ·35 in., pubescent.

Malacca; Maingay, (Kew Distrib.) No. 54. Penang: Curtis, No. 648. Perak; Scortechini.

I am not satisfied that there are not two species involved here, the one with broader leaves and shorter pubescence.

10. Popowia nervifolia, Maingay MSS. ex Hook. fil. Fl. Br. Ind. I, 60. A small tree 12 to 25 feet high: young branches at first densely rusty-tomentose, afterwards dark-coloured and furrowed. *Leaves* coriaceous, from oblong-lanceolate or ob-lanceolate to elliptic-oblong, shortly abruptly and bluntly acuminate, the base acute; upper surface shining,

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glabrous except the puberulous midrib; lower paler, sparsely rusty-pubescent; main nerves 10 or 11 pairs, oblique, rather prominent on the lower surface; length 5·5 to 8·5 in., breadth 1·8 to 3 in.; petiole ·35 to ·5 in., rusty-pubescent. *Flowers* polygamous, extra-axillary, solitary or 2 or 3 together, sub-globose, from ·5 to ·75 in. in diam.; pedicels, stout, tomentose, ·15 to ·25 long, with 2 bracts nearly as large as the sepals. *Sepals* ovate-orbicular, acute, slightly smaller than the outer petals, very thick, villous-tomentose outside and glabrous inside as are all the petals: inner petals larger than the outer, their apices much inflexed in bud. *Stamens* numerous, with flat, rhomboid heads. *Ovaries* numerous, hirsute. *Carpels* numerous, cylindric-ovoid, apiculate, narrowed to the stalk, sparsely strigose, ·5 in. long and ·25 in. in diam.; stalks ·2 to ·3 in. long, strigose-pubescent; torus globular, ·4 in. in diam. *Seed* pale, shining.

Malacca: Maingay (Kew Distrib.,) No. 53. Perak: common at low elevations.

Allied to *P. Kurzii*, but with larger flowers which have their inner petals valvate with much inflexed edges.

11. Popowia Kurzii, King. A shrub or small tree; young branches at first tawny-pubescent, afterwards dark-coloured, glabrous and furrowed. *Leaves* sub-coriaceous, oblong-lanceolate, or elliptic-oblong sub-acute or shortly and bluntly acuminate, narrowed to the sub-cuneate (sometimes almost rounded) base; upper surface sub-granular, minutely and sparsely adpressed-pubescent; lower sparsely pubescent; main nerves 9 to 12 pairs, oblique, inter-arching close to the edge, rather prominent beneath; length 5 to 9 in., breadth 1·5 to 3 in.; petiole ·2 to ·25 in., tomentose. *Flowers* polygamous, solitary, or in pairs, sub-sessile, extra-axillary, sub-globose, ·4 in. in diam.; pedicels tomentose, ·1 to ·2 in. long, bracteolate. *Sepals* smaller than the petals, valvate, semi-orbicular, and, like the petals, tomentose externally and glabrous internally. *Petals* sub-equal, concave, the outer ovate-orbicular, valvate; the inner slightly smaller than the outer, imbricate. *Stamens* numerous, flattened, elongate, with linear, lateral anther-cells and flat, oblique, rhomboid apices. *Ovaries* (often absent) about 10, elongate, pubescent, the stigmas clavate. *Fruit* unknown. *Polyalthia macrophylla*, Hook. fil. and Thoms. Fl. Br. Ind. I, 68. *P. dubia* Kurz F. Flora Burma, I, 38. *Guatteria macrophylla*, Blume Bijdr. 19; Fl. Javae Anon. 96. t. 97; Miq. Fl. Ind. Bat. I, Pt. 2, 47.

South Andaman; Kurz, King's Collector. Burmah; province Tenasserim; Falconer, Kurz.

This species appears to be practically dicœcious. In its flowers the inner petals are distinctly imbricate; they are not connivent, and

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their points are not inflexed. And in these respects they do not answer to the diagnosis of *Popowia* as heretofore understood. I have therefore ventured to modify the generic character of *Popowia* in these points, and to institute a section of it to receive this and other two species. This species is closely allied to the plant originally described and figured by Blume as *Guatteria macrophylla*, (Fl. Jav. Anon. 96 t. 47,) and to receive which Miquel founded his genus *Trivalvaria* (Ann. Mus. Lugd. Bat. II, 19). But, in Blume's and Miquel's plant, the inner petals are distinctly valvate, although their apices are not inflexed. And in the non-inflection of its petals it also does not conform to the character of *Popowia* as originally defined by its founder Endlicher.

12. Popowia Hookeri, King. A shrub; young branches dark-coloured, glabrous. *Leaves* thinly coriaceous, broadly lanceolate or oblanceolate, acute or acuminate, the base acute: both surfaces glabrous, the lower silvery, shining: main nerves about 7 pairs, spreading, ascending, curving, rather prominent beneath, evanescent at the tips; length 5·5 to 7 in., breadth 1·6 to 2·4 in. *Flowers* solitary or in fascicles of 2 or 3 from short extra-axillary, woody tubercles, polygamous, minute; "the males as in *Popowia Kurzii* but smaller; the females with many, densely pubescent ovaries and a few imperfect stamens; bracts many, minute, strigose. *Carpels* many, ·75 in. long, oblong, granulate, glabrous; stalk ·35 in." *Guatteria pallida*, H. f. and Th. Fl. Ind., 143 (not of Blume). *Polyalthia argentea*, Hook. fil. and Thoms. Fl. Br. Ind. I, 67.

Assam and Sylhet; in dense forests, Hook. fil. and Thomson; Naga Hills, Masters. Khasia: Griffith.

A species of which I have seen only imperfect specimens. The description given above of the flowers is copied from Sir Joseph Hooker. In my opinion the plant is a *Popowia* rather than a *Polyalthia* and to the former genus I have ventured to remove it.

*Doubtful Species.*

*Popowia parvifolia*, Kurz in Journ. of Botany for 1875, p. 324. Of this I have seen only leaf specimens with a few detached fruits. It appears to have also had the MSS. name *P. nitida* given to it by Kurz.

18. Oxymitra, Blume.

Climbing shrubs. *Leaves* parallel-nerved; nervules transverse, not forming intra-marginal loops. *Flowers* leaf-opposed or extra-axillary. *Sepals* 3, valvate, connate below. *Petals* 6, valvate, in 2 rows, outer large, long, flat or triquetrous and narrow, leathery, more or less spreading or connivent; inner much smaller, ovate-lanceolate or oblong (long and narrow in *O. filipes* and *O. glauca*), conniving over the stamens and



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ovaries. *Stamens* many, linear-oblong or cuneate, truncate; anther-cells dorsal, remote (small and ovoid in *O. glauca*). *Ovaries* oblong, strigose; style oblong or clavate, recurved; ovules 1–2, sub-basal, ascending. *Ripe carpels* 1-seeded, stalked.—Distrib. About 28 species, Asiatic and African.

A genus of which the flowers have some resemblance to those of *Goniothalamus*: but in this the inner petals are not contracted into a claw as in *Goniothalamus* and the calyx in this is smaller and not persistent.

Outer petals flat ... ... ... 1. *O. affinis.*
Outer petals concave.
Pedicels slender, much longer than the flowers 2. *O. filipes.*
Pedicels shorter than the flowers.
Leaves oblong-elliptic, more or less obovate, blunt ... ... ... 3. *O. calycina.*
Leaves oblong-elliptic to oblong-lanceolate or elliptic-lanceolate, not obovate, acute, or acuminate.
Outer petals expanded and concave in the lower third; the inner only one fourth as long as the outer, very acuminate ... ... ... 4. *O. biglandulosa.*
Outer petals narrowly linear-lanceolate, slightly expanded and concave at the very base ... ... 5. *O. glauca.*

1. Oxymitra affinis, Hook. fil. and Thoms. Fl. Br. Ind. I, 70. A spreading shrub or climber: young branches at first densely rusty tomentose, afterwards dark-coloured and glabrous. *Leaves* membranous, elliptic to oblong-elliptic, sometimes slightly obovate, acute or very shortly acuminate, rarely obtuse, the base rounded or slightly narrowed; upper surface shining, minutely scaly, glabrous except the pubescent midrib; under surface slightly glaucous, pubescent especially on the midrib and nerves; main nerves 8 to 14 pairs, spreading, ascending, rather prominent on the lower surface; length 3·5 to 10 in., breadth 1·25 to 4·5 in.; petiole ·3 in., tomentose. *Flowers* solitary, extra-axillary; pedicels ·25 to ·4 in. *Sepals* slightly connate at the base, spreading, broadly ovate or orbicular-ovate, sub-acute, 3- to 7-nerved, adpressed-pubescent, ·5 in. long and slightly narrower than the base of the petals, persistent in the fruit. *Petals* flat, very unequal; the outer thinly coriaceous, oblong-lanceolate, sub-acute, the midrib thick and with several strong sub-parallel nerves, adpressed-pubescent on both surfaces, 1·5 to 1·75 in. long and ·4 to ·6 in. broad; inner petals thickly coria-

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ceous, ovate, sub-acute, ·5 in. long, pubescent outside, glabrous inside. *Ripe carpels* cylindric, blunt at each end, pubescent, ·5 to ·8 in. long and ·3 in. in diam.: stalks pubescent, ·2 in. long. *Seed* solitary.

Malacca; Maingay, (Kew Distrib.) No. 39. Perak; King's Collector, Scortechini. Distrib., Siam.

2. Oxymitra filipes, H. f. and Th. Fl. Br. Ind. I, 71. A climber: young branches softly brown-tomentose, dark-coloured and lenticellate when old. *Leaves* membranous, oblong-lanceolate or oblong-elliptic, often slightly obovate, acute or shortly acuminate, slightly narrowed to the sub-cordate sometimes slightly oblique base; upper surface glabrous, minutely scaly, sometimes pubescent, the midrib and nerves always so; under surface paler, sub-glaucous, pubescent, the midrib tomentose; main nerves 12 to 14 pairs, spreading, prominent beneath; secondary nerves obliquely transverse, prominent: length 4·5 to 7·5 in., breadth 1·4 to 2·5 in.; petiole ·2 to ·25 in., tomentose. *Flowers* very long and narrow, often curved, 1·75 to 2·5 in. long, solitary on slender extra-axillary pedicels 3 or 4 in. long, which are pubescent and have a subulate bract near the middle. *Sepals* ·25 in. long, spreading, ovate, acute, pubescent. *Petals* very unequal; the outer fleshy, very narrow, triquetrous, expanded and concave at the base, pubescent; the inner less than one fifth of the outer in length, lanceolate with caudate-acuminate apex, glabrous. *Stamens* numerous: ovaries 1-ovuled. *Ripe carpels* numerous, ovate-cylindric, shortly apiculate, softly pubescent, ·5 in. long and ·25 in. in diam.; stalks ·3 in. long, pubescent. *Seed* solitary, pale.

A species readily distinguished in this genus by the extreme length and narrowness of the outer petals. Evidently closely allied to *O. cuneiformis*, Miq. (*Polyalthia cuneiformis*, Bl. Fl. Javae Anon. 75 t. 35, 36D, 37), which it resembles in that respect as also in its filiform, elongated pedicels.

Malacca; Maingay, (Kew Distrib.) No. 60. Perak: King's Collector.

3. Oxymitra calycina, King, n. sp. A slender, woody creeper; young branches densely rusty tomentose. *Leaves* coriaceous, oblong and sub-acute or cuneiform-oblong, very blunt or even emarginate, always slightly narrowed to the rounded or minutely cordate base; upper surface glabrous, shining, the midrib sometimes rufous-pubescent; under surface pale, glaucous, pubescent especially on the midrib and nerves: main nerves 7 to 14 pairs, prominent on the under, impressed on the upper, surface, spreading; the secondary nerves obliquely transverse, prominent: length 6 to 12 in., breadth 2·65 to 7·5 in., petiole ·2 to ·4 in., rufous tomentose. *Flowers* solitary, extra-axillary; pedicels ·3 to 1 in.,

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rufous-tomentose, bearing two bracts, one small, the other large, obovate, ribbed. *Sepals* free, nearly half as long as the outer petals, elliptic, sub-acute; the edges undulate, rufous-tomentose on both surfaces. *Petals* thick, lanceolate, caudate-acuminate, the midrib prominent, the base concave, both rows glabrous inside, the outer about 1 to 1·25 in. long, tomentose outside; the inner about ·5 in. shorter, connate into a narrow, acute cone, puberulous outside. *Ovaries* 1-ovuled. *Ripe carpels* elliptic, apiculate, pubescent, ·35 in. long: stalks ·2 in., pubescent.

This closely resembles *Oxymitra cuneiformis*, Miq. of which Blume (under the name of *Polyalthia cuneiformis*) gives an excellent description and three admirable figures (Fl. Javae Anon. 75 t. 35, 36D. and 37. But in Blume's plant the flowers are much larger, the petals are falcate, while the sepals are much smaller and have caudate apices: the pedicels too are much longer and have smaller bracteoles.

Perak: Ulu Bubong at elevations of 500 to 1,000 feet, King's Collector, No. 10604. Singapore: Ridley. Penang; Curtis.

4. Oxymitra biglandulosa, Scheffer in Nat. Tijdsch. Ned. Ind. XXXI, 341. A creeper 50 to 100 feet long; young branches minutely rufous-sericeous, afterwards dark-coloured and glabrous. *Leaves* coriaceous, elliptic to elliptic-oblong, acute or shortly acuminate, the edges slightly recurved when dry, the base rounded or slightly cuneate; upper surface glabrous, the midrib puberulous; the lower paler, subglaucous, puberulous or glabrescent; main nerves 7 to 9 pairs, ascending, prominent beneath; length 3·5 to 7·5 in., breadth 2 to 3·5 in., petiole ·2 to ·4 in. *Flowers* shortly pedicelled, solitary, extra-axillary, 1 to 1·15 in. long: pedicels ·4 in. long (elongating in fruit) angled, slender, with 1 subulate bracteole. *Sepals* fleshy, ovate, much acuminate, spreading or reflexed, adpressed, rusty-puberulous. *Petals* fleshy, yellow, very unequal: the outer lanceolate-oblong, obtuse, expanded and concave in the lower third, rusty adpressed-pubescent; the midrib prominent, sub-glabrous inside; the inner only as large as the sepals, with broad bases (cleft in the middle) and long acuminate points. *Ripe carpels* oblong-ovoid, blunt at each end or slightly apiculate at the apex, yellow when ripe, puberulous or glabrous, ·75 in. long: stalks ·5 in. *Polyalthia biglandulosa*, Hook. fil. Fl. Br. Ind. I, 65. *Guatteria biglandulosa*, Blume Fl. Javae Anon. 102, t. 51; Miq. Fl. Ind. Bat. I, Pt. 2, p. 48; Hook. fil. and Thoms. Fl. Ind. 143.

Malacca; Griffith, Maingay, (Kew Distrib.) No. 49. Selangor; Ridley. Perak, King's Collector. Distrib.: Malayan Archipelago.

The structure of the flowers of this species appears to me to be that of an *Oxymitra* rather than of a *Polyalthia* or *Guatteria*, and therefore I have transferred it to this genus.

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5. Oxymitra glauca, H. f. and Th. Fl. Ind. 146; Hook. fil. Fl. Br. Ind. I, 71. A slender woody climber: young branches slightly tomentose, soon becoming glabrous. *Leaves* thinly coriaceous, elliptic, elliptic-lanceolate to lanceolate, obtuse, acute or shortly acuminate; the base rounded, sometimes slightly narrowed; upper surface glabrous, the midrib and sometimes the nerves pubescent; the lower very pale, glaucous, glabrous or sparsely puberulous, the midrib pubescent; main nerves 8 to 12 spairs, spreading, prominent beneath: length 4 to 6 in., breadth 1·5 to 2 in.; petiole ·2 in., pubescent. *Flowers* solitary, extra-axillary, narrow and elongate; pedicels slender, ·5 in. long, with a median subulate bract, longer in fruit. *Sepals* connate at the base, broadly ovate, much acuminate, adpressed-pubescent, ·25 in., long. *Petals* very unequal: the outer thickly coriaceous, linear-lanceolate, sub-acute, slightly expanded and sub-concave at the base, outside minutely pubescent; inside glabrous, the midrib prominent: inner petals with sub-orbicular bases (cleft in the middle), and long acuminate points, glabrous, only about one-fifth as long as the outer. *Ovaries* hairy; ovule solitary. *Carpels* many, ovoid, slightly apiculate, ·4 in. long and ·25 in. in diam., minutely tomentose; stalks slender, ·75 in. long. Miq. Fl. Ind. Bat. I, Pt. 2, 50.

Penang, Malacca: Maingay (Kew Distrib.) No. 58. Perak; common at low-elevations. Distrib.: Sumatra, Beccari, No. 626.

### 19. Melodorum, Dunal.

Climbing shrubs. *Flowers* terminal, axillary and leaf-opposed, fascicled or panicled; buds triquetrous. *Sepals* 3, small, valvate, connate below. *Petals* 6, valvate, in 2 rows; outer plano-convex or trigonous: inner triquetrous above, hollowed below on the inner face. *Stamens* many; anther-cells dorsal, contiguous; top of connective more or less flattened, triangular, quadrate or orbicular. *Pistils* many, free; style oblong; ovules 2 or more. *Ripe carpels* berried.—Distrib:—species about 35. Tropical Asia and Africa; Australia.

Section I. Melodorum proper. *Outer petals* oblong-ovate; ovaries hairy, ovules usually more than 4. *Seeds* smooth (unknown in *M. litseaefolium*).

Flowers not more than ·4 in. long (often ·5 in. in *M. fulgens*), flower-buds broadly pyramidal.

Flowers ·2 to ·25 in. long, in few-flowered, lax, axillary racemes; leaves beneath hoary-pubescent with a superficial layer of flexuose hairs: ovules 4 — 1. *M. litseaefolium.*

Flowers ·4 to ·5 in. long; solitary, or in

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few-flowered terminal or leaf-opposed cymes; leaves beneath sparsely and minutely strigose: ovules 4 ... 2. *M. fulgens.*

Flowers ·5 in. or more in length (see also *M. fulgens*).

Flower-buds broadly pyramidal.

Flowers racemose, rarely solitary. Leaves glabrous above except the midrib, beneath densely golden-brown sericeous. Ripe carpels ovoid-globose, 1·25 in. long, their stalks 2 to 3 in. long ... 3. *M. manubriatum.*

Flowers in axillary or terminal panicles. Leaves minutely pubescent above, softly brown-tomentose beneath: ripe carpels globose to ovoid, velvetty-tomentose, 1 to 2·25 in. long; stalks ·75 to 1·75 in. ... ... ... 4. *M. latifolium.*

Flowers always solitary and axillary. Ripe carpels cylindric, sub-tubercular, 1 to 1·75 in. long 5. *M. cylindricum.*

Flower-buds narrowly pyramidal, racemose or paniculate.

Leaves glabrous above except the midrib, beneath glaucous hoary-puberulous. Ripe carpels globose or ovoid-globose, tubercled, 1 in. long, their stalks 1 in. ... 6. *M. hypoglaucum.*

Leaves glabrescent or glabrous above, except the midrib; beneath softly rufous-pubescent. Ripe carpels globular, densely and minutely dark brown-tomentose, ·8 in. in diam.; their stalks slightly longer ... ... 7. *M. parviflorum.*

Leaves harshly pubescent above, uniformly and softly pubescent beneath. Ripe carpels globose, harshly and minutely pubescent, 1·1 in. in diam.; stalks slender, twice as long ... ... 8. *M. sphaerocarpum.*

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Section II. PYRAMIDANTHE. Outer petals very long, linear-lanceolate, 1·2 to 5 in. long. *Flowers* solitary or in pairs, axillary, rarely leaf-opposed (cymose in *M. lanuginosum* and *M. rubiginosum*.)

Ovules more than 4.

Flowers 1·25 to 1·5 in. long; outer petals rufous-lanate externally; ripe carpels subglobose, ·79 in. in diam. ... ... 9. *M. lanuginosum.*

Flowers 1·25 to 1·5 in. long; outer petals minutely rufous-tomentose externally; ripe carpels oblong, tapering to both ends, 1·5 to 2 in. long ... ... ... 10. *M. Maingayi.*

Flowers 1·5 to 2 in. long; outer petals minutely rufous-tomentose outside; ripe carpels ovoid, tuberculate, 1·4 in. long ... 11. *M. prismaticum.*

Ovules 4.

Flowers 3 to 5 in. long; outer petals adpressed-puberulous externally ... 12. *M. macranthum.*

Section III. KENTIA. Outer petals not much longer than broad, broadly ovate or sub-orbicular, with broad thick margins: flowers axillary; ovaries glabrous, 2 to 8-ovuled: seeds pitted.

Ovules about 8: ripe carpels ovoid or ovoid-globose; leaves oblong-lanceolate ... 13. *M. elegans.*

Ovules 2; ripe carpels globular: leaves elliptic or elliptic-oblong, sometimes obovate ... ... ... 14. *M. pisocarpum.*

1. MELODORUM LITSEÆFOLIUM, King, n. sp. A powerful climber: young branches densely but minutely rusty-tomentose, afterwards tuberculate and sub-glabrous. *Leaves* coriaceous, oblong-ovate to oblong, acute, the base rounded or slightly cuneate; upper surface greenish when dry, glabrous, shining except the rufous-pubescent midrib; lower reticulate; uniformly hoary-pubescent with a superficial layer of deciduous yellowish or reddish flexuose hairs; main nerves 8 to 10 pairs, oblique, curving, prominent beneath; length 2·75 to 4·25 in., breadth 1·35 to 1·6 in. *Flowers* ·2 to ·25 in. long, in few-flowered lax axillary rufous-tomentose racemes or in terminal panicles; pedicels ·25 to ·35 in. long with a single small median bracteole. *Sepals* broadly ovate-acute, concave, connate at the base, spreading, ·1 in. long. *Petals* broadly ovate-oblong, acute, leathery; outer ·3 in. long, slightly concave and glabrous at the base, otherwise puberulous inside, rufous-tomentose outside; the inner petals much smaller, hoary-puberulous except the pitted glabrous concavity at the base inside. *Stamens* numerous, apical process of the connective broadly and bluntly triangular;

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filaments short. *Ovaries* few, oblong, oblique, rufous-pubescent, 4-ovuled; stigma lateral, oblong. *Ripe carpels* unknown.

Perak: King's Collector, Nos. 4063 and 4986.

The flowers of this resemble those of *M. fulgens*, H. f. and Th., but they are smaller and more numerous than those of *M. fulgens;* the petals of this species also are thinner and the apical process of the anthers is broader and blunter. The leaves too of this are broader and, in the indumentum on their lower surface, they differ considerably from those of *M. fulgens*. Fruit of this species is as yet unknown. The ovaries have only 4 ovules.

2. MELODORUM FULGENS, Hook. fil. Fl. Br. Ind. 120. A large climber; young branches minutely tawny-pubescent, speedily becoming glabrous and dark-coloured. *Leaves* oblong-lanceolate, acuminate, the base rounded or sub-acute; upper surface pale olivaceous when dry, glabrous, the midrib strigose; under surface brown when dry, sparsely and minutely strigose, especially on the midrib; main nerves 11 to 13 pairs, oblique, curving; length 3 to 4·5 in., breadth 1·2 to 1·5 in.; petiole ·25 to ·4 in. pubescent. *Flowers* ·4 to ·5 in. long, solitary or in terminal or leaf-opposed, few-flowered cymes: pedicels ·3 to ·4 in. long, adpressed tawny-pubescent with one sub-medial and one basal bracteole. *Sepals* broadly ovate, sub-acute, connate at the base, spreading, ·1 in. long, pubescent outside, glabrous inside. *Petals* thick; the outer flat, ovate-oblong, sub-acute, tawny-pubescent outside, glabrous at the base inside, ·5 in. long; inner petals like outer but concave at the base, only ·3 in. long and glabrous, except near the apex outside. *Stamens* numerous; apical process of connective of the outer lanceolate and as long as the anthers, that of the inner shorter. *Ovaries* narrowly oblong, oblique, curved, minutely pubescent, with 4 ovules in two rows: style lateral, half as long as the ovary, stigma small. *Ripe carpels* ovoid-globose densely and minutely silky tawny-tomentose like the stalks, 1 to 1·5 in, long, and ·9 in. in diam.; stalks ·85 to 1·5 in. long, stout. *Seeds* oblong, plano-convex, brown, shining. Hook. fil. Fl. Br. Ind. I, 82. Miq. Fl, Ind. Bat. I, Pt. 2, 35. *Uvaria fulgens* and *Myristica Finlaysoniana*, Wall. Cat. 6482 and 6793.

Malacca, Perak, Singapore. Distrib. Borneo, Philippines.

3. MELODORUM MANUBRIATUM, Hook. fil. and Thoms. Fl. Ind. 118. A large creeper: young branches minutely rufous-pubescent. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, the base rounded or slightly narrowed; upper surface olivaceous when dry, glabrous, the midrib rufous-pubescent; lower uniformly covered with rather thin brown or golden sericeous tomentum; main nerves 12 to 18 pairs, oblique, slightly curved, rather prominent beneath; length 2 to 4·5 in.,

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breadth ·75 to 1·5 in.; petiole ·3 in., tomentose. *Flowers* ·6 to ·75 in. long, leaf-opposed or extra-axillary, in short racemes, rarely solitary; pedicels ·25 to ·75 in., softly pale rufous-tomentose, with one broad clasping bracteole near the base. *Sepals* broadly ovate, shortly sub-acuminate, spreading, connate at the base, sericeous outside, glabrous inside. *Petals* leathery, ovate-lanceolate, sub-acuminate, concave, the outer ·6 to ·75 in. long, outside sericeous, inside puberulous in the upper half, glabrous in the lower; the inner petals smaller, minutely pubescent in the upper half outside and near the apex inside, otherwise glabrous, the base very concave. *Stamens* numerous, the connective bluntly triangular at the apex. *Ovaries* numerous, oblong, densely sericeous; ovules 8 in 2 rows; stigma sessile, glabrous, bifid. *Ripe carpels* numerous, ovoid-globose, with thick pericarp, about 1·25 in. long, densely rufous-tomentose; stalks 2 to 3 in. long. *Seeds* about 8, in two rows. Hook. fil. Fl. Br. Ind. I, 79; Miq. Fl. Ind. Bat. I, Pt. 2, 35. *Melodorum bancanum*, Scheff. Nat. Tijds. XXXI, 343. *Uvaria manubriata*, Wall. Cat. 6456.

Penang, Malacca, Singapore. Perak: very common. Distrib.: Bangka.

4. MELODORUM LATIFOLIUM, Hook. fil. and Thoms. Fl. Ind., 116. A large climber; young shoots velvety rufous-tomentose. *Leaves* coriaceous, oblong or narrowly elliptic, sub-acute or obtuse, the base rounded; upper surface minutely pubescent, the midrib tomentose; lower surface uniformly covered with short, soft, brown tomentum; main nerves 16 to 24 pairs, spreading, bold, not inter-arching: length 3 to 7·5 in., breadth 1·75 to 2·5 in.; petiole ·4 to ·7 in., stout, channelled, tomentose. *Flowers* from ·6 to 1·25 in. in diam. when expanded, brown, in lax axillary or terminal racemes or panicles; pedicels ·35 to ·5 in. with bracteole at the base. *Sepals* broadly ovate, blunt, connate into a flat triangular cup, ·25 in. wide, tomentose outside, glabrous within like the outer petals. *Petals* thick, fleshy, ovate, acuminate, ·4 to ·7 in. long; the inner much smaller. *Stamens* very numerous, the apex of the connective triangular, acute; anther-cells linear, lateral, *Ovaries* about 6, obliquely oblong, densely sericeous, 6- to 8-ovuled; stigma small, sessile. *Ripe carpels* globose to ovoid, slightly apiculate and slightly tapering to the base, densely velvety and minutely tomentose, 1 to 2·25 in. long and 1 to 1·2 in. in diam.: stalks stout, velvety, ·75 to 1·75 in. long; Hook. fil. Fl. Br. Ind. I, 79; Miq. Fl. Ind. Bat. I, pt. 2, 35; Wall. Cat. 9411. *M. mollissimum*, Miquel Fl. Ind. Bat. Suppl. 374. *Uvaria latifolia*, Blume Fl. Jav. Anon. t. 15. *Unona latifolia*, Dunal Anon. 115. *Uvaria longifolia*, Bl. Bijdr. 13.

Malacca; Griffith. Singapore; Maingay, Hullett. Perak: very common. Distrib.:—Sumatra, Java, Philippines.



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*Uvaria latifolia*, Blume, as described and figured by that author has larger flowers than the common Perak plant and its carpels are globular, whereas those of the Perak plant are ovoid and apiculate. The plant figured by Blume does, however, occur there, but it is not common. The forms may be characterised thus :—

Var. *typica:* flowers ·7 in. long: fruit globular, not apiculate, 1 in. in diam. *Uvaria latifolia*, Blume l. c. t. 15. Perak, Java.

Var. *ovoidea:* flowers ·5 in. long: fruit ovoid, slightly apiculate, often oblique, as much as 2·25 in. long, very oblique and warted when young. *M. latifolium*, H. f. and Th. Fl. Br. Ind. 79. Malacca, Perak, Singapore. The common form in the Malay Peninsula.

5. Melodorum cylindricum, Maingay in Hook. fil. Fl. Br. Ind. I, 80. A climber: young branches minutely rusty-pubescent, speedily glabrous and dark-coloured. *Leaves* coriaceous, elliptic-oblong, brownish when dry, acute or acuminate, the base rounded or slightly narrowed; upper surface quite glabrous, the lower paler, minutely pubescent; main nerves 8 to 10 pairs, spreading, very faint; length 2·5 to 4·25 in., breadth 1·6 to 1·8 in., petiole ·5 in. *Flowers* ·5 in. long, solitary, axillary, drooping; buds short, pyramidal, adpressed, brown-pubescent: pedicel short, stout, with minute bracteole. *Sepals* small, triangular, connate, forming a flat spreading cup. *Outer petals* triangular-ovate, triquetrous with an excavated base; the inner very small, triangular, glabrous. *Stamens* numerous, the apex of the connective orbicular. *Ovaries* 4 to 6, sericeous. *Ripe carpels* cylindric, curved, both ends obtuse, sub-tubercular, minutely brown-pubescent, 1 to 1 75 in. long and ·35 to ·75 in. in diam.; pericarp thin; stalk ·5 in. long, stout. *Seeds* many, horizontal, in two series, compressed, ·65 in. long, shining, with a small cartilaginous arillus.

Malacca; Maingay (Kew Distrib.) No. 78. Singapore: Ridley, No. 2115.

6. Melodorum hypoglaucum, Miquel in Ann. Mus. Lugd. Bat. II, 37. A strong creeper: young branches minutely rufous-pubescent, ultimately glabrous, rather pale and much tubercled. *Leaves* thinly coriaceous, oblong-lanceolate to oblong-elliptic, acute or shortly acuminate, the base rounded or cuneate; upper surface glabrous except the rufous-puberulous midrib; lower minutely hoary-puberulous, the 10 or 12 pairs of bold oblique curving main nerves ultimately glabrous and darker-coloured; length 3 to 5·5 in., breadth 1·35 to 2·2 in., petiole ·25 in. *Flowers* ·5 to ·8 in. long, in lax, 2-to 3-flowered, axillary racemes or (by abortion of the leaves) in lax, terminal, 10- to 12-flowered panicles; pedicels as long as the flowers, slender; bracteoles 1 or 2, minute. *Sepals* ovate, acute, concave, conjoined only at the base, rufous-pubescent outside; puberulous within. *Petals* leathery, linear-lanceolate,

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the base expanded and concave: the outer minutely rufous-tomentose on the external surface, paler and pubescent on the internal, ·5 to ·8 in. long, concave for their whole length: the inner one-third shorter with a glabrous concavity at the base only, the rest triquetrous, and puberulous. *Stamens* numerous; apical process of connective large, broader than the anther-cells, sub-globular. *Ovaries* about 12, oblong, golden-silky: with 4 to 6-ovules in 2 rows: stigma large sub-capitate; style short. *Ripe carpels* globose or ovoid-globose, tubercled, puberulous or glabrescent, 1 in. long; stalks about the same length, striate. *Seeds* about 4 or 5, oval, compressed, smooth, brown, shining.

Perak: Scortechini, King's Collector.

This plant agrees fairly well with the only specimens of *Melodorum hypoglaucum*, Miq. which I have been able to consult. It also agrees fairly with Miquel's description of that species. But its petals and stamens, and its ovaries externally are rather those of *Xylopia* than of *Melodorum;* although its habit, its torus and carpels are emphatically those of the latter genus In the number of ovules it agrees with the majority of the species of *Melodorum*. It thus forms a connecting link between the two genera.

7. MELODORUM PARVIFLORUM, Scheffer in Nat. Tijdsch. Ned. Ind. XXXI, 344. A powerful climber; young shoots minutely rusty-tomentose, the bark dark-coloured. *Leaves* coriaceous, more or less broadly elliptic, abruptly acute; the base broad, rounded: upper surface pale yellowish-green when dry, when young minutely stellate-pubescent, when old glabrescent or quite glabrous, the midrib always tomentose; under surface softly rufous-pubeseent, the nervation and venation very prominent; main nerves 13 to 15 pairs, oblique, curving, inter-arching close to the edge; length 3 to 6 in., breadth 2·25 to 3·2 in., petiole ·4 in. *Flowers* ·5 in. long, in lax axillary or terminal rusty racemes often more than half as long as the leaves: pedicels ·4 to ·6 in. long with 1 or 2 small bracteoles. *Sepals* triangular, spreading, connate at the base, rusty-tomentose outside, glabrescent inside like the petals, ·1 in. long. *Petals* thick, leathery, oblong-lanceolate with broad bases; the outer ·5 in. long; the inner smaller, concave at the base, triquetrous in the upper half. *Stamens* numerous, the connective with compressed sub-quadrate apical appendage. *Ovaries* narrow, elongate, densely sericeous, 6- to 8-ovuled. *Ripe carpels* globular, sometimes very slightly apiculate, densely but minutely dark-brown tomentose, ·8 in. diam.; stalks rather longer, slender, tomentose.

Perak: King's Collector.—Distrib.: Bangka.

A species closely allied to *M. sphaerocarpum*, Blume. The leaves of this are, however, larger, the upper surface is stellate-tomentose

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when young and dries a pale yellowish-green; the flower-racemes are much longer and laxer, and the flowers larger.

8. Melodorum sphaerocarpum, Miq. Fl. Ind. Bat. I, pt. 2, p. 35. A strong climber: young branches and all others parts more or less dark rusty-velvety tomentose. *Leaves* elliptic-oblong, obtuse and very slightly apiculate, slightly narrowed to the rounded base; upper surface with harsh, short pubescence, the midrib tomentose; lower surface uniformly and minutely soft-pubescent: main nerves 8 to 12 pairs, oblique not inter-arching at the tips, prominent beneath; the connecting veins transverse oblique, rather prominent, length 2·5 to 4·5 in., breadth 1·25 to 2 in., petiole ·35 in. *Flowers* ·6 or ·7 in. in diam., in axillary or terminal racemes or panicles; pedicels ·35 to ·5 in. long with a small supra-basal bracteole. *Sepals* ovate-acuminate, connate at the base, spreading, minutely tomentose outside, glabrescent inside. *Petals* thick, leathery, brown outside, pink within, ovate, acuminate, slightly pouched at the base; the outer ·3 to ·35 in. long, tomentose outside, puberulous within: the inner smaller than the outer, more concave at the base, glabrous or glabrescent, the upper part very thick. *Stamens* numerous, the apex of the connective thick, obliquely triangular; anther-cells linear, lateral. *Ovaries* about 6, elongate, oblique, pubescent, with 6 to 8 ovules: style short, glabrous: stigma small. *Ripe carpels* globular, harshly and minutely pubescent, 1·1 in. in diam.: stalks rather slender, about twice as long. *Unona sphaerocarpa*, Blume Bijdr. 12: Fl. Javae Anon. 79 t. 16.

Perak: King's Collector.

This is allied to *M. latifolium;* but has smaller leaves with fewer nerves; its pubescence is very dark rusty, not tawny; and the apices of the anthers are truncate, not bearing a broad triangular, acute point. It is also allied to *M. parviflorum*, Scheff.

9. Melodorum lanuginosum, Hook. fil. and Thoms. Fl. Ind. 117. A strong creeper; young branches softly rufous-tomentose. *Leaves* coriaceous, oblong, sometimes sub-obovate-oblong, abruptly acute or shortly acuminate, rarely obtuse, the base rounded; upper surface glabrous, the midrib rufous-tomentose, olivaceous when dry; lower surface densely rufous-lanate; main nerves 12 to 20 pairs, oblique, curving, inter-arching close to the edge, prominent beneath; length 3·5 to 9 in., breadth 1·9 to 3·5 in.; petiole ·4 to ·6 in., stout, tomentose. *Flowers* 1 25 to 1·5 in. long, axillary or leaf-opposed, solitary, or in short 2- to 4-flowered cymes; pedicels stout, lanate, ·5 in. long, with a single basal bracteole. *Sepals* ovate, spreading, slightly connate, golden or rufous-lanate outside, glabrous inside like the outer petals. *Petals* thick, leathery, oblong-lanceolate from a broad base, sub-acute, the outer 1 25

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to 1·5 in. long; the inner smaller, glabrescent or glabrous, concave at the base. *Stamens* numerous. the connective obliquely triangular at the apex; the anther-cells very narrow, lateral. *Ovaries* obovoid, oblique, curved, densely sericeous, 4- to 6-ovuled; style glabrous. *Ripe carpels* sessile, shortly stalked, sub-globose, narrowed to the base; densely and softly rufous-tomentose, about ·75 in. in diam. when ripe; seeds about 4. Miq. Fl. Ind. Bat. I, Pt. 2, 35; Hook. fil. Fl. Br. Ind. I, 79. *Uvaria tomentosa*, Wall. Cat. 6454.

Penang: Wallich, Curtis. Singapore; Wallich. Pangkore: Curtis. Penang; Scortechini, Wray, King's Collector.

At once distinguished by its large flowers, lanate leaves and sessile, or shortly stalked, rufous-tomentose fruit.

10. Melodorum Maingayi, Hook. fil. and Thoms. Fl. Br. Ind. I, 80. A climber: young branches pubescent, dark-coloured. *Leaves* coriaceous, reddish-brown when dry, broadly elliptic or oblong, rounded at both ends, the tip sometimes minutely apiculate; upper surface glabrous except the puberulous midrib; lower glaucous and finely pubescent; main nerves 14 to 16 pairs, spreading, slightly prominent and dark-coloured beneath; length 3 to 6 in., breadth 1·5 to 2·35 in.; petiole ·6 in. *Flowers* 1·25 to 1·5 in. long, solitary, axillary; buds swollen at the base, narrowed and triquetrous above: pedicels ·25 to ·5 in., stout; bracteoles several, small. *Sepals* orbicular, sub-acute, quite connate into a disk, ·35 in. in diam. *Petals* leathery; the outer oblong-lanceolate, with broad base, flat but keeled down the middle inside, outside minutely rufous-tomentose, inside hoary-pubescent; inner very small, triangular-ovate, glabrous. *Stamens* numerous, small, with a broad rounded apical process, convex. *Ovaries* about 6, sericeous on one side; stigma sub-sessile. *Ripe carpels* oblong, tapering to each end, the apex shortly beaked, rusty-puberulous; the pericarp thick, 1·5 to 2 in. long and ·75 in. in diam.; stalks ·5 in. long, stout. *Seeds* many, in horizontal rows, ·5 in. long testa shining, not margined.

Penang; Maingay (Kew Distrib.,) No. 108, Curtis, No. 1046. Perak: Wray, 1112.

11. Melodorum prismaticum, Hook. fil. and Thoms. Fl. Br. Ind. 121. A large creeper; young branches glabrous, dark-coloured. *Leaves* coriaceous, oblong, elliptic-oblong, rarely obovate-oblong, abruptly and shortly acuminate; the base broad, rounded: upper surface glabrous except the minutely puberulous midrib; lower surface glaucous, reticulate, finely pubescent especially on the midrib; main nerves 12 to 18 pairs, spreading, faint especially near the tip, the secondary nerves prominent; length 4·5 to 8·5 in., breadth 2·3 to 3·3 in., petiole ·5 to ·7 in. *Flowers* 1·5 to 2 in. long, axillary, solitary; pedicels ·3 to ·6 in. long,

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rufous-tomentose, with 1 large bracteole above the middle and several smaller near the base. *Sepals* quite connate into a flat, obtusely 3-angled disk, ·3 in. broad, pubescent outside, glabrous and tubercled inside. *Petals* very thick: the outer linear-lanceolate, 1·5 to ·2 in. long, triquetrous, rufous-tomentose outside, puberulous inside: the inner thinner and only about ·3 in. long, triangular, ridged outside, much excavated and glabrous at the base inside, otherwise puberulous. *Stamens* numerous, with very short filaments, anthers linear, apex of connective obliquely triangular. *Ovaries* elongate, oblong, tapering to the apex, shortly pubescent: ovules about 14, in 2 rows; style short, lateral; stigma sub-capitate, lobulate. *Ripe carpels* ovoid, blunt, tuberculate, puberulous, becoming sub-glabrous, 1·4 in. long and ·8 in. in diam.: stalks ·8 to 1 in., stout. *Seeds* in 2 rows, horizontal compressed, oval, black, shining. Hook. fil. Fl. Br. Ind. I, 81; Miq. Fl. Ind. Bat. I, Pt. 2, 36. *Pyramidanthe rufa*, Miq. Ann. Mus. Lugd. Bat. II, 39. *Uvaria rufa*, Wall. Cat. 6455. *Oxymitra bassiæfolia*, Teysm, and Binnin. in Tijdsch. Ned. Ind. XXV, (1863), 419.

Penang, Malacca, Perak, Singapore: common. Distrib.: Borneo.

Authentic specimens both of *Pyramidanthe rufa* and of *Oxymitra bassiæfolia*, T. and B. shew that they unmistakably belong to this species. Specimens of the former from Bangka and from the Buitenzorg Botanic Garden have, however, their leaves rather more hairy beneath than is usual in Perak specimens and their flowers are also rather longer.

12. Melodorum macranthum, Kurz in Journ. As. Soc. Bengal, 1872, Pt. II, 291; 1874, Pt. II, 56; F. Flora Burma, I, 42. A small tree: all parts except the young leaf-buds and the flower glabrous; young branches dark-coloured, rather slender. *Leaves* membranous, elliptic-oblong, sometimes slightly obovate, shortly and abruptly acuminate, the base cuneate; upper surface shining, the lower dull; main nerves 12 to 16 pairs, faint and much more prominent than the secondary, forming a double set of intra-marginal arches: length 6 to 8 in., breadth 2·5 to 3·5 in., petiole ·3 to ·4 in. *Flowers* solitary, axillary or from the branches below the leaves, 3 to 5 in. long, drooping; pedicels ·5 to ·75 in. long, obscurely bracteolate at the base only. *Sepals* broadly ovate, sub-acute, coriaceous, pubescent at the edges inside, glabrous outside, connate for half their length, ·45 in. long. *Petals* greenish-white, becoming yellowish, coriaceous; narrowly linear-lanceolate, acuminate, the outer row flat, adpressed-puberulous with a glabrous patch at the base inside, 3 to 5 in. long; the inner row only 1 to 1·25 in long, cohering by their edges, vaulted at the base and with a glabrous patch; the limb keeled inside, puberulous on both surfaces. *Stamens* numerous, the anther-cells linear, elongate; apical process of connective narrowly tri-

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angular, pointed. *Ovaries* numerous, narrowly oblong, adpressed-rufous-pubescent, 4-ovuled: style nearly as long as the ovary, cylindric, bent outwards, glabrous; stigma small, slightly bifid. *Ripe carpels* oblong, blunt, tapering at the base, slightly rugose, glabrous, 1·25 to 1·5 in. long and about ·5 or ·6 in. in diam.: stalk ·4 to ·5 in. *Seeds* 1 or 2, compressed, ovoid, smooth. *Unona macrantha*, Kurz. in Andam. Report, Ed. I, App. B. I: *Pyramidanthe macrantha*, Kurz. l. c. Ed. 2, p. 29.

S. Andaman; Kurz, King's Collector.

In some of its characters, (*e. g.*, the erect habit, the fewness of the ovules, and the thin texture and flatness of the much elongated outer petals) this does not quite conform to the characters of typical *Melodorum*. By its thin elongated outer petals, it approaches the *Dasymaschalon* section of *Unona;* but the fewness of its ovules excludes it therefrom. From *Xylopia*, which it in some respects resembles, it is chiefly excluded by the very convex torus of its flowers, and by the very pointed apical appendage of its stamens. The stamens on the other hand are those of *Melodorum*, and the petals resemble those of *M. prismaticum* (*Pyramidanthe rufa*, Miq.). On the whole therefore, I think, it best to leave this plant in the genus to which Kurz finally referred it.

13. Melodorum elegans, Hook. fil. and Thoms. Fl. Ind. 122. A large climber: young branches slender, puberulous at first, ultimately glabrous, dark-coloured. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, slightly narrowed to the rounded base: upper surface olivaceous when dry, glabrous: lower paler, puberulous, minutely reticulate, the 12 or 13 pairs of main nerves spreading, faint: length 2·5 to 3·5 in., breadth 1 to 1·25 in., petiole ·25 to ·35 in. *Flowers* axillary, solitary or 2 or 3 in a fascicle, ·35 to ·65 in. long: pedicels slender, ·35 to ·6 in. long often deflexed, with 2 or 3 minute basal bracteoles. *Sepals* ovate, acute, united at the base only, spreading, outside tubercular and pubescent, inside glabrous and concave, ·1 in. long. *Petals* leathery, the outer broadly ovate, sometimes minutely ovate-oblong, silky, rufous-tomentose outside, hoary-puberulous within, with a perfectly glabrous patch at the concave base, ·35 to ·6 in long: inner petals only ·25 in. long, very thick, triquetrous and puberulous above, concave and glabrous at the base, inside. *Stamens* numerous, with filaments half as long as the anther-cells; apical process of connective short, thick, obliquely triangular. *Ovaries* narrowly oblong, glabrous, with 8 ovules in 2 rows: style short, lateral. *Ripe carpels* ovoid or ovoid-globose, blunt at each end, glabrous, ·35 to ·5 in. long: stalks slender, ·25 in. long, compressed, black, shining, pitted. Hook. fil. Fl. Br. Ind. I, 82: Miq. Fl. Ind. Bat. I, pt. 2, p. 36. *Uvaria elegans*, Wall. Cat. 6474A.

This is closely allied to *M. fulgens*, H. f. and T.; but its flowers have

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more slender and usually longer pedicels: the ovary of this is moreover glabrous, while that of *M. fulgens* is pubescent and the carpels of this are under half an inch in length, while those of *M. fulgens* are three times as long. This is also allied to *M. Kentii*, H. f. and Th., the ovaries of which have, however, never more than two ovules.

Penang: Wallich. Malacca: Maingay (Kew Distrib.,) No. 75. Perak: King's Collector, Wray, Scortechini.

14. MELODORUM PISOCARPUM, Hook. fil. and Thoms. Fl. Ind. 123. A powerful climber: young branches glabrous, black. *Leaves* coriaceous, elliptic or elliptic-oblong, sometimes obovate-elliptic, shortly and abruptly acuminate; the base rounded or sub-cuneate: upper surface olivaceous when dry, glabrous, shining; the lower glaucous, slightly puberulous when young: main nerves 10 to 12 pairs, spreading, very indistinct; length 2·5 to 4 in., breadth 1·25 to 1·8 in., petiole ·35 in. *Flowers* ·3 to ·65 in. long, axillary, solitary or in pairs; pedicels rather stout, deflexed, rufous-puberulous, bi-bracteolate at the base, ·25 to ·35 in. long. *Sepals* broadly ovate, acute, concave, connate into a triangular cup, rufous-puberulous outside, glabrous inside, persistent. *Petals* thick: the outer flat, oblong-ovate, acute, minutely silky, rufous-tomentose outside, hoary pubescent inside except on the glabrous basal excavation, ·3 to ·65 in. long: *inner petals* less than half as long, with a large glabrous basal concavity and a short, thick, triquetrous point, hoary-puberulous. *Stamens* numerous, filament very short, apical process of connective orbicular. *Ovaries* narrowly oblong, glabrous, pitted, 2-ovuled: style lateral, nearly as long as the ovary. *Ripe carpels* globular, slightly tubercled, glabrous, ·25 in. in diam.: stalks about as long. *Seeds* 2, plano-convex, dark-brown, shining, pitted. Hook. fil. Fl. Br. Ind. I, 82; Miq. Fl. Ind. Bat. I, Pt. 2, 37. *M. pyramidale*, Maingay MSS. *Uvaria mabiformis*, Griff. Notulae, IV, 709.

Malacca; Griffith, Maingay (Kew Distrib.) No. 77. Singapore; Ridley. Penang; Curtis. Perak; common. Distrib. Sumatra, Forbes, No. 2182.

Only two species of *Melodorum* besides this have glabrous ovaries (*M. Kentii* and *M. elegans*); but whereas those of this and *M. Kentii* are 2-ovuled, the ovaries of *M. elegans* have 8, or, according to Sir Joseph Hooker, sometimes 10 ovules. This species has however different leaves from the two above mentioned, and its carpels are much smaller and quite globular. As in other species of *Melodorum*, there is considerable variability in the size of the flowers in this species.

### 20. XYLOPIA, Linn.

Trees or shrubs. *Leaves* coriaceous. *Flowers* axillary, solitary

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cymose or fascicled; buds triquetrous, conic, often slender. *Sepals* 3, valvate, connate. *Petals* 6, elongate, valvate, in 2 series; outer flat or concave; inner nearly as long, trigonous, concave at the base only. *Torus* flat, or hollow and enclosing the carpels. *Stamens* oblong, truncate or connective produced; anther-cells remote or contiguous, often septate and with a large pollen-grain in each cellule. *Ovaries* 1 or more; style long, clavate; ovules 2–6 or more, 1- to 2-seriate. *Ripe carpels* long or short, continuous or moniliform, usually several-seeded.—Distrib. Tropics generally; species 60 to 70.—Closely allied to *Melodorum*, but very different in habit.

Leaves quite glabrous.

- Leaves 6 or 7 in. long ... ... 1. *X. oxyantha.*
- Leaves between 3 and 5 in. long.
  - Ripe carpels cylindric, boldly tubercled 2. *X. dicarpa.*
  - „ „ „ smooth ... 3. *X. malayana.*
- Leaves between 2 and 3 in. long.
  - Flowers always solitary; pedicels with 2 or 3 orbicular bracteoles, apical process of stamens rounded, anther-cells septate ... ... ... 4. *X. Maingayi.*
  - Flowers solitary or in pairs, ·5 in. long: pedicels with orbicular basal bracteoles; apical process of stamens rounded; anther-cells septate... ... 5. *X. pustulata.*
  - Flowers in fascicles or solitary, ·75 in. long: pedicels ebracteolate; apical process of stamens oblong: anther-cells not septate ... ... 6. *X. fusca.*

Both surfaces of leaves glabrous, the midrib alone pubescent in its lower half on the upper surface; length 5·5 to 9·5 in. ... ... 7. *X. Curtisii.*

Leaves glabrous on the upper surface (the midrib pubescent in *X. caudata*), the lower slightly pubescent or puberulous.

- Leaves more or less lanceolate, acute or acuminate, not at all obovate.
  - Leaves 2 or 3 in. long.
    - Leaves not glaucous beneath.
      - Flowers ·5 to ·57 in. long, solitary, axillary, obtuse ... 8. *X. elliptica.*
      - Flowers ·2 to ·25 in. long, axillary, solitary, or 2 to 3 together ... ... 9. *X. caudata.*



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| | | |
|---|---|---|
| Leaves glaucous beneath ... | 10. | *X. stenopetala.* |
| Leaves 3·5 to 5·5 in. long, leaves glaucous beneath; petals very long and narrow ... ... ... | 10. | *X. stenopetala.* |
| Leaves more or less obovate or oblanceolate, 4 to 7 in. long. | | |
| Leaves 1·75 to 4 in. broad; flower pedicels ·2 to ·25 in. long; ripe carpels broadly ovoid, blunt, sub-glabrous ... | 11. | *X. Scortechinii.* |
| Leaves 1·75 to 2·5 in. broad; flower pedicels ·5 to ·8 in. long; ripe carpels globular, densely and minutely yellowish-tomentose ... ... | 12. | *X. olivacea.* |
| Upper surfaces of leaves glabrous (the midrib alone pubescent in some): under surfaces uniformly pubescent. | | |
| Under-surface of leaves adpressed-rufous-sericeous; length 2 to 3 in. ... ... | 13. | *X. obtusifolia.* |
| Under-surface of leaves deep brown, the pubescence slightly paler; length 3 to 4·5 in.; ripe carpels obovoid-oblong, blunt | 14. | *X. magna.* |
| Under-surface of leaves purplish-brown, pubescent; length 3·5 to 5·5 in.; main nerves 10 to 12 pairs; ripe carpels much elongate, cylindric, many-seeded ... ... | 15. | *X. ferruginea.* |
| Under-surface of leaves brownish-tomentose; length 6·5 to 8·5 in.; nerves 12 to 14 pairs ... ... ... | 16. | *X. Ridleyi.* |

1. XYLOPIA OXYANTHA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree: young parts puberulous; the branchlets rather stout, striate. *Leaves* coriaceous, ovate or oblong, abruptly and shortly acuminate, glabrous, glaucous on the lower surface; main nerves 12 to 15 pairs, spreading, thin; length 6 to 7 in., breadth 2·5 to 3 in., petiole ·35 in. *Peduncles* axillary, in fascicles, ·35 to ·5 in. long, adpressed-pubescent. *Sepals* broadly ovate. *Outer petals* narrowly linear, tapering at the apex, yellowish pubescent, slightly keeled at the back, 1·25 to 1·5 in. glon *Stamens* and *ovaries* as in *X. ferruginea*. *Habzelia oxyantha*, Hook. fil and Th. Fl. Ind. 124; Miq. Fl. Ind. Bat. I, pt. 2, 37. *Uvaria oxyantha*, Wall. Cat. 6478.

Singapore: Wallich.

2. XYLOPIA DICARPA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree 20 to 25 feet high; branches glabrous, dark-coloured, minutely

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dotted. *Leaves* coriaceous, elliptic-lanceolate, acute or acuminate, the base acute; both surfaces glabrous, minutely reticulate; main nerves about 10 pairs, spreading, very faint, the secondary nerves almost as distinct; length 3 to 4·5 in., breadth 1·5 to 1·75 in., petiole ·25 in. *Flowers* solitary or in pairs, pendent, 1·5 in. long: pedicel very short with 1 to 3 orbicular, amplexicaul, glabrous bracteoles. *Sepals* ovate, obtuse, tubercled, connate to the middle. *Petals* linear oblong, slightly expanded and concave at the base, hoary, pubescent; the inner narrower and shorter than the outer, sub-trigonous. *Stamens* numerous, the inner rudimentary: apical process rounded; anthers linear, septate. *Ovaries* 2 to 4, pilose, multi-ovular: style short. *Ripe carpels* cylindric, blunt at each end, much tubercled, puberulous, 1·5 in. long and about ·75 in. in diam. *Seeds* 7 or 8, compressed, the testa pale, scaly.

Singapore: Maingay (Kew Distribution *in part*) No. 84, King's Collector No. 7079.

3. Xylopia Malayana, Hook. fil. and Thoms. Fl. Ind. 125. A slender tree: young branches thin, glabrous, the buds pubescent. *Leaves* thinly coriaceous, shortly and bluntly acuminate, the base cuneate; both surfaces glabrous; main nerves about 8 pairs, faint, spreading; length 3·5 to 5 in., breadth 1·5 to 2 in., petiole ·2 in. *Flowers* ·6 to ·9 in. long, solitary or in pairs, axillary; pedicels rufous-pubescent, ·1 in. long, with several bracteoles at the base. *Sepals* broadly ovate, subacute, puberulous outside and on the edges, glabrous inside, ·15 in. long and as broad. *Petals* linear-oblong, tapering to the apex, concave and glabrous at the slightly expanded base, densely pubescent elsewhere; the inner slightly narrower and shorter than the outer and more concave at the base. *Stamens* numerous, the apices rhomboid, papillose; the anthers long, lateral, with transverse divisions. *Pistils* about 6; the ovaries oblong, densely pale-hirsute, about as long as the stamens, 2-ovuled; styles about as long as the ovaries and projecting far above the stamens, glabrous, sub-cylindric, clavate. *Ripe carpels* (fide Maingay) ·35 to 1 in., several-seeded; stalk short, thick. Hook. fil. and Thoms. Fl. Br. Ind. I, 85; Miq. Fl. Ind. Bat. I, Pt. 2, 38. *Parartabotrys sumatrana*, Miq. Fl. Ind. Bat. Suppl. 374; Scheffer in Nat. Tijdsch. Ned. Ind. XXXI, 15.

Malacca; Griffith, Derry, Maingay (Kew Distrib.) No. 81. Singapore, Ridley. Perak; Scortechini. Distrib., Sumatra.

4. Xylopia Maingayi, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree? Young branches rusty-pubescent, afterwards glabrous and with white dots. *Leaves* small, coriaceous, elliptic or elliptic-oblong, subacute or obtusely acuminate, the base sub-cuneate: both surfaces glabrous and reticulate, the upper pale, the lower dark; main nerves slender; length 2

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to 3 in., breadth 1 to 1·25 in.; petiole ·25 to ·3 in. *Flowers* solitary, pendent, pale-orange; pedicels very short, stout, curved; bracteoles 2 or 3, orbicular, rusty-tomentose. *Sepals* broadly ovate, connate to the middle, rusty-tomentose. *Petals* flat, linear-oblong, sub-acute, softly tomentose except the glabrous concave base; the inner narrower, almost as long, trigonous. *Stamens* with rounded apiculus: the anthers narrow, septate. *Ovaries* about 9, with 6 ovules; style glabrate. *Ripe carpels* unknown.

Malacca: Maingay.

5. XYLOPIA PUSTULATA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree: young branches pale, glabrous, minutely white-dotted. *Leaves* coriaceous, small, elliptic, sub-obtuse, the base acute, both surfaces glabrous, the lower reddish brown and reticulate: main nerves faint, not more prominent than the secondary. *Flowers* solitary or in pairs, axillary, ·5 in. long, pendent; pedicels very short, with orbicular, ciliate, deciduous basal bracteoles. *Sepals* short, ovate, sub-acute, rusty-pubescent, united to the middle. *Petals* linear, sub-acute, densely adpressed-pubescent; the outer obtuse with a rather broad concave base, the inner shorter and much narrower with a broader concave base. *Stamens* linear with rounded apiculus: the anthers long, septate. *Ovaries* 5 to 8, hirsute; the style slender with clavate stigma; ovules several. *Ripe carpels* unknown.

Malacca: Maingay (Kew Distribution) No. 86.

6. XYLOPIA FUSCA, Maingay ex Hook. fil. Fl. Br. Ind. I, 85. A tree; young branches rather stout, glabrous, black: buds silky. *Leaves* coriaceous, oblong, obtuse, the base cuneate; upper surface glabrous shining; the lower dull, dark, reticulate; main nerves 8 or 9 pairs, very faint; length 2 to 3 in., breadth ·75 to 1 in.; petiole ·2 in., stout. *Flowers* ·75 in. long, supra-axillary, solitary, racemed, or fascicled; peduncle ·25 to ·75 in. with several bracts; pedicels ·25 in., puberulous, ebracteolate. *Sepals* ovate, acute, connate into a cup with 3 spreading, acute teeth, puberulous outside. *Petals* linear-oblong, tapering to the sub-acute apex: the outer adpressed golden-sericeous outside; the inner narrower and shorter, concave at the base. *Stamens* with an oblong apical process; anthers linear, lateral, not septate. *Ovaries* 4 or 5, cohering into a cone, golden-silky; ovules 10 to 16, in two rows. *Ripe carpels* unknown.

Malacca: Maingay, (Kew Distribution) No. 86.

7. XYLOPIA CURTISII, King, n. sp. A tree 30 feet high: young branches stout, glabrous, striate, dark-coloured. *Leaves* very coriaceous, oblong, acute or shortly acuminate; the base cuneate, slightly oblique: upper surface glabrous, shining; the lower dull, darker (when dry),

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puberulous on the midrib near the base; main nerves 12 to 20 pairs, very prominent beneath and connected by straight transverse veins; length 5·5 to 9·5 in., breadth 2 to 3 in.; petiole ·35 in., stout. *Flowers* 1 or 2, on stout woody extra-axillary peduncles; pedicels ·2 in. long, rufous-pubescent, with a single large bracteole. *Sepals* thick, spreading, broadly ovate, sub-acute, minutely tomentose on both surfaces but especially on the outer. *Petals* thick, subequal, linear-oblong, obtuse, keeled outside; the claw orbicular, vaulted over the andro-gynœcium and glabrous inside, otherwise minutely tomentose, ·75 in. long. *Stamens* numerous, the heads obliquely truncate and concealing the linear, lateral anthers. *Ovary* solitary, cylindric, fluted, glabrous, multi-ovulate. *Ripe carpel* ovoid, compressed, silvery-grey, many-seeded, 3 in. long, and 2·5 in. in diam.

Penang: Curtis, No. 1569.

8. XYLOPIA ELLIPTICA, Maingay ex Hook. fil. Fl. Br. Ind. I, 86. A tall tree: young branches dark-coloured, glabrous, the youngest pubescent. *Leaves* membranous, small, elliptic, obtusely acuminate, the base rounded or acute: upper surface glabrous, pale; the lower brown, minutely adpressed-pubescent; both reticulate: main nerves 6 or 7 pairs, oblique, very faint; length 1·5 to 2 in., breadth 1 to 1·25 in.; petiole ·2 in., slender. *Flowers* solitary, erect, axillary, ·5 to ·75 in. long: peduncle about half as long, rusty-pubescent like the calyx, bracteoles minute. *Sepals* ovate, sub-acute, united to the middle. *Petals* pale brownish-tomentose; the outer linear-subulate with a broader concave base: the inner trigonous, shorter and narrower than the outer. *Stamens* numerous, minute, the apex rounded; anthers linear. *Ovaries* 1 to 3, densely hairy, 4- to 6-ovuled. *Ripe carpels* unknown.

Malacca: Maingay (Kew Distrib.,) No. 82. Perak: Wray No. 3194. Penang: Curtis, No. 2482:

9. XYLOPIA CAUDATA, Hook. fil. and Thoms. Fl. Ind. 125. A shrub or small tree: young branches very slender, minutely pubescent. *Leaves* thinly coriaceous, lanceolate, long and obtusely acuminate, the base cuneate; upper surface glabrous except the pubescent midrib; the lower sparsely adpressed-sericeous: main nerves about 10 pairs, spreading, faint; length 2 to 2·25 in., breadth ·6 to ·8 in.; petiole ·1 in., slender. *Peduncles* 1 to 3, axillary, very short, minutely bracteolate at base and apex. *Flowers* ·2 to ·3 in. long. *Sepals* ovate, sub-acute, connate at the base, adpressed-pubescent outside, glabrous inside. *Petals* linear-oblong, obtuse, pubescent except a small glabrous concave spot at the base, the inner about as long as, but narrower than, the outer. *Anthers* rather numerous, compressed, the apical process narrow. *Ovaries* 2, elongate, sericeous, 2-ovuled: style long, pointed, glabrous, exserted.

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*Ripe carpels* (fide Hooker) 2 or 3, sub-globose or ovoid, pubescent, ·5 in. long, 2-seeded. Hook. fil. Fl. Br. Ind. I, 85; Miq. Fl. Ind. Bat. I, Pt. 2, 38. *Guatteria (?) caudata*, Wall. Cat. 6452.

Singapore: Wallich, Maingay (Kew Distrib.) No. 79. Malacca; Griffith.

10. Xylopia stenopetala, Oliver in Hook. Ic. Plantar. t. 1563. A tree 50 to 60 feet high: young branches dark-coloured, glabrescent, minutely lenticellate. *Leaves* thinly coriaceous, elliptic-oblong, shortly and obtusely acuminate, the base sub-cuneate; upper surface glabrous, shining; the lower glaucous or glaucescent, sparsely adpressed-pubescent; both reticulate; main nerves 10 or 12 pairs, spreading, interarching close to the edge, faint: length 2·5 to 4·5 in., breadth 1·1 to 1·6 in., petiole ·25 in. *Flowers* axillary, solitary or in fascicles of 2 to 5; pedicels slender, often decurved, puberulous, with one minute bracteole, ·5 to ·75 in. long. *Sepals* united to form a small puberulous cup with acute, spreading teeth. *Petals* fleshy, very narrow, slightly expanded and concave at the base, minutely tawny-pubescent, the inner slightly shorter and narrower. *Stamens* linear, the connective prolonged into a cylindro-conic apical appendage; the anthers fusiform, lateral. *Ovaries* numerous, elongate, pubescent, 6-ovuled; style filiform: stigma subclavate. *Ripe carpels* oblong, sub-terete, narrowed to the stalk, 2 to 2·5 in. long and ·5 in. diam.: pericarp fleshy. *Seeds* 1 to 4: stalks thick, ·3 in. long.

Penang; on Government Hill at 600 feet: Curtis Nos. 857 and 880.

11. Xylopia Scortechinii, King n. sp. A tree 50 to 60 feet high: young branches rusty-tomentose, ultimately glabrous, much striate and pale brown. *Leaves* coriaceous, obovate-elliptic to elliptic-oblong, very shortly and abruptly acuminate, slightly narrowed to the sub-cuneate rounded slightly oblique base: upper surface glabrous, the midrib slightly rufous-puberulous near the base: lower surface pale, sparsely rufous-pubescent especially on the midrib and 10 to 14 pairs of oblique, rather straight, prominently raised main nerves; length 4 to 7 in., breadth 1·75 to 4 in.; petiole ·35 in., pubescent. *Flowers* rarely solitary, usually in fascicles of 2 to 5 on tubercles in the axils of leaves or of fallen leaves; pedicels short, (·2 to ·25 in.), stout, rusty-tomentose with a sub-mesial bracteole. *Sepals* quite free, broadly ovate, blunt, pubescent outside, glabrous inside. *Petals* thickened, linear-obtuse with an orbicular concave claw, vaulted over the stamens and pistils, 1·25 to 1·75 in. long, pubescent everywhere except on the glabrous concavity of the claw. *Stamens* numerous, with truncate 4- or 5-angled apices concealing the lateral anthers. *Ovaries* few, short, oblong, pubescent, 4- or 5-ovuled; stigma large, oblong. *Ripe carpels* broadly ovoid, blunt, rufous-pubes-

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cent when young, glabrescent when old, ·8 in. long and ·6 in. in diam. *Seeds* about 4, discoid, pale brown, shining. *Drepananthus stenopetala*, Scortechini, MSS.

Perak: Scortechini, No. 1781; King's Collector, No. 8241.

A species allied to *X. olivacea*, King; but with broader leaves, shorter flower pedicels, narrower petals and ovoid sub-glabrous fruit.

12. XYLOPIA OLIVACEA, King n. sp. A shrub or small tree: young branches pubescent, ultimately brown, striate and glabrous. *Leaves* thinly coriaceous, elliptic-oblong, sometimes slightly obovate, shortly and abruptly acuminate, the base cuneate; both surfaces dull olivaceous when dry; the upper glabrous, the lower paler, slightly scurfy; main nerves 6 to 8 pairs, oblique, curving, inter-arching boldly ·15 in. from the margin, prominent beneath; length 3·5 to 7 in., breadth 1·75 to 2·5 in., petiole ·25 in., swollen, puberulous, black when dry. *Flowers* solitary or in pairs, supra-axillary; pedicels rather stout, ·5 to ·8 in. long, cinereous-tomentose with an ovate-lanceolate, mesial bracteole. *Sepals* thick, especially at the base, ovate, acute, connate below the middle, pale cinereous-puberulous on both surfaces. *Petals* sub-equal, fleshy, narrowly linear with a tapering limb and slightly expanded concave vaulted claw, densely and minutely cinereous-tomentose, 1 to 1·5 in. long, the inner shorter. *Stamens* short, cuneate, the broad oblique heads covering the apices of the linear anthers. *Ovaries* few, oblong, densely sericeous, 6- to 8-ovuled; style short, cylindric: stigma large, fleshy. *Ripe carpels* few, globular, with slightly flattened minutely apiculate apex, and an imperfect lateral ridge, densely and minutely yellowish-tomentose, ·6 in. in diam., stalks very short. *Seeds* 4 or 5, discoid, smooth, pale brown, shining, separated from each other by imperfect dissepiments.

Perak: up to elevations of 3,000 or 4,000 feet, common. Scortechini, Wray, King's Collector.

13. XYLOPIA OBTUSIFOLIA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree: young branches glabrous, dark-coloured, striate: buds silky. *Leaves* coriaceous, oblong, obtuse or retuse, the base cuneate, upper surface glabrous, shining; the lower adpressed rufous-sericeous: main nerves 8 or 10 pairs, oblique, very faint; length 2 to 3 in., breadth 1 to 1·5 in., petiole ·25 in. *Flowers* ·5 in. long, axillary, solitary or 2 or 3 in small sub-racemose cymes; pedicels ·2 to ·25 in., rufous-pubescent with a single bracteole. *Sepals* thick, broadly ovate, acute, united to the middle, pubescent outside, glabrous inside. *Petals* linear-oblong, tapering towards the blunt apex; the outer petals adpressed-rufous-pubescent outside, puberulous within, slightly concave and glabrous at the base; the inner smaller, more concave at the glabrous base, puberu-

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lous elsewhere. *Stamens* numerous, elongate, narrow, with an acute apiculus; the anther-cells linear, lateral. *Pistils* one or two, conical, adpressed-pubescent; the style short, thin. *Ripe carpels* oblong, cylindric, sub-oblique, blunt, 1·25 in. long ·7 in. in diam. *Seeds* 3 or 4, globular.

Malacca: Griffith. Perak: King's Collector, No. 2816.

14. XYLOPIA MAGNA, Maingay ex Hook. fil. Fl. Br. Ind. I, 84. A tree: young branches tomentose, becoming glabrous and darkly cinereous. *Leaves* coriaceous, ovate-lanceolate to elliptic, sub-acute, the base rounded, the edges slightly revolute when dry; upper surface shining, reticulate, glabrous except the pubescent midrib; under surface deep brown, with rather pale pubescence; main nerves about 10 pairs, spreading, inter-arching some way from the edge, faint: length 3 to 4·5 in., breadth 1·25 to 2 in.; petiole ·25 in., pubescent. *Flowers* 2 to 2·5 in. long, solitary or in pairs, axillary: pedicels stout, tomentose, with a single large, ovate, acute, often bifid bract. *Sepals* thick, ovate acute, connate into a 3-toothed cup, adpressed-pubescent outside, glabrous inside. *Petals* sub-equal, the inner narrower and shorter, narrowly linear, slightly expanded and concave at the base, tapering towards the apex, pubescent except in the basal concavity. *Stamens* numerous, elongate, with an oblong obtuse apical process; the anthers lateral, linear, septate. *Pistils* about 15, narrowly oblique, hirsute on the outer side, 4-ovuled. *Style* filiform, long. *Ripe carpels* obovoid-oblong, compressed, blunt, minutely tomentose, 1·4 in. long and ·65 in. diam.; stalks thick, only ·15 in. long. *Seeds* about 4, in two rows, arillate, the testa bony.

Malacca: Maingay (Kew Distrib.) No. 83. Singapore; Ridley. Perak; Scortechini.

15. XYLOPIA FERRUGINEA, Hook. fil. and Thoms. Fl. Br. Ind. I, 85. A tree 20 to 60 feet high; young branches brownish-pubescent. *Leaves* coriaceous, narrowly oblong, acute; the base slightly narrowed and oblique, rounded or minutely sub-cordate; upper surface glabrous, shining; the lower glaucous and softly purplish-brown pubescent: most densely so on the midrib; main nerves 10 to 12 pairs, oblique, inter-arching near the edge, prominent beneath; length 3·5 to 5·5 in., breadth 1·1 to 2 in.; petiole ·2 in., channelled. *Flowers* solitary or in pairs, axillary or extra-axillary, erect or pendulous, yellow; pedicels ·5 to ·75 in., rusty-pubescent; bracteoles 1 to 3, small, lanceolate. *Sepals* broadly ovate-acuminate, connate at the base, spreading, small, pubescent outside, glabrous within. *Petals* linear, fleshy, tapering at the very apex, very long; the outer rufous-pubescent outside, cinereous-puberulous inside, concave at the very base, 1·25 to 2 in. long; inner petals much

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narrower and thinner and a little shorter than the outer, cinereous-puberulous. *Stamens* about 24, narrow: anthers linear, lateral, the connective ending in a broadly oblong apical process. *Ovaries* numerous, narrowly oblong, pointed, densely rusty-hirsute, multi-ovular: style short, filiform, glabrous; stigma minute. *Ripe carpels* numerous, much elongate, cylindric, glabrescent, with transverse partitions between the seeds, many-seeded, sub-moniliform when dry, 2 to 5 in. long. *Seeds* oblong, rugose, minutely pellucid-dotted, ·3 in long. *Habzelia ferruginea*, H. f. and T. Fl. Ind. 123. Miq. Fl. Ind. Bat. I, Pt. 2, 37. *Artabotrys malayana*, Griff. Notul. IV, 713.

Malacca: Griffith. Maingay (Kew Distrib.) No. 85. Perak: Scortechini, King's Collector, Wray: common. Selangor: Curtis.

16. Xylopia Ridleyi, King n. sp. A tree? Young branches stout, densely rusty-tomentose. *Leaves* coriaceous, obovate-elliptic, abruptly and very shortly acuminate, narrowed from below the middle to the slightly cuneate base: upper surface glabrous except the rufous-puberulous midrib: lower softly rusty-tomentose with longer, superficial, paler hairs: main nerves 12 to 14 pairs, oblique, inter-arching boldly within the margin, prominent on the lower, depressed on the upper, surface; length 6·5 to 8·5 in., breadth 2·75 to 3·5 in.; petiole ·5 to ·6 in. stout, tomentose. *Flowers* in extra-axillary (often leaf-opposed) fascicles of 3 to 5: pedicels stout, rufous-tomentose, with a single bracteole, ·25 to ·3 in. long. *Sepals* broadly ovate, long-acuminate, rufous-pubescent outside, glabrous within, ·35 in. long. *Petals* filiform, triquetrous, with expanded concave vaulted bases concealing the andro-gynœcium, and glabrous inside, otherwise pubescent, 2·5 to 3·5 in. long. *Stamens* numerous, with truncate 4- or 5-angled heads concealing the elongate, lateral anthers. *Ovaries* obliquely ovoid, densely sericeous, 4- to 6-ovuled: stigmas fleshy, agglutinated. *Ripe carpels* unknown.

Singapore: Ridley.

### 21. Phœanthus, H. f. and T.

Trees or climbers. *Flowers* solitary, terminal or in extra-axillary fascicles. *Sepals* 3, small, valvate. *Petals* 6, valvate in 2 rows; outer small like the sepals; inner large, flat, coriaceous. *Stamens* numerous, oblong or quadrate, truncate; anther-cells dorsal, distant. *Carpels* numerous; style cylindric or clavate, sometimes grooved ventrally. *Ovules* 1–2, sub-basal, ascending. *Ripe carpels* staked, 1-seeded.—Distrib. Species about 6; one in Southern Peninsular India, the rest Malayan.

| | | | |
|---|---|---|---|
| Leaves softly pubescent | ... | ... | 1. *P. nutans.* |
| Leaves glabrous. | | | |
| Ovules and seeds solitary | ... | ... | 2. *P. lucidus.* |
| Ovules and seeds in pairs | ... | ... | 3. *P. andamanicus.* |



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1. PHÆANTHUS NUTANS, H. f. and Th. Fl. Ind. 147. A small tree: young branches rusty tomentose. *Leaves* membranous, oblong-lanceolate or oblanceolate to obovate-elliptic, caudate-acuminate, the base always narrowed and sometimes acute; upper surface glabrous, the midrib and main nerves tomentose; lower softly pubescent, the midrib tomentose: main nerves 10 to 14 pairs, spreading, prominent beneath, inter-arching near the edge: length 5 to 9 in., breadth 1·3 to 4·5 in.; petiole ·3 in., tomentose. *Flowers* fœtid, solitary or 2 or 3 together, drooping, extra-axillary; pedicels ·5 to 1·5 in. long with 1 or 2 linear bracteoles, pubescent. *Sepals* linear-lanceolate, spreading, tomentose, ·2 in. long. *Petals* very unequal; the outer small like the sepals; inner ovate-oblong, acute, yellow, pubescent, 5- to 7-ribbed, ·75 to 1 in. long. *Ripe carpels* ovoid, pubescent, beaked, ·6 in. long and ·35 in. in diam.; stalk nearly as long. Hook. fil. Fl. Br. Ind. I, 72; Miq. Fl. Ind. Bat I, pt. 2, 51. *Uvaria nutans*, Wall. Cat. 6481. *U. tripetala*, Roxb. Fl. Ind. ii, 667. *U. ophthalmica*, Roxb. ex Don Gen. Syst. i, 93.

Singapore; Wallich and others. Penang; Curtis. Malacca; Maingay, (Kew Distrib.) No. 67. Perak; at low elevations. Sugei Ujong; Ridley. Distrib. Moluccas, Sumatra.

2. PHÆANTHUS LUCIDUS, Oliver in Hook. Ic. Pl. t. 1561. A tree 40 to 50 feet high: young branches minutely rusty pubescent or almost glabrous, dark-coloured and furrowed. *Leaves* thickly membranous, oblong-elliptic to lanceolate, acuminate, the base cuneate; both surfaces shining, glabrous except occasionally the puberulous midrib; main nerves about 8 pairs, oblique, rather prominent beneath: length 4·5 to 6·5 in., breadth 1·25 to 2·25 in.; petiole ·2 in. *Flowers* solitary, rarely in fascicles of 2 or 3, extra-axillary, erect, ·6 in. to 1 in. in diam., buds triquetrous; peduncles 1 to 1·25 in. long, slender, puberulous, with 2 minute bracteoles. *Sepals* ovate, acute, less than ·1 in. long. *Outer petals* like the sepals but a little longer: inner petals thick, greenish-yellow, oblong-ovate, acute, about ·5 in. long, glabrescent with puberulous edges. *Anthers* with square truncate heads. *Ovaries* numerous, 1-ovulate. *Ripe carpels* oblong, ·6 in. long and ·3 in. in diam., minutely granular, sub-glabrous as are the ·5 to ·6 in. long stalks.

Penang: Curtis. Perak: at low elevations: King's Collector, Nos. 7275 and 10044.

3. PHÆANTHUS ANDAMANICUS, King n. sp. A small glabrous shrub: young branches pale brown, slender. *Leaves* membranous, elliptic or elliptic-lanceolate, acute, slightly narrowed to the rounded base, both surfaces rather pale when dry; main nerves 15 to 20 pairs, faint, slender, horizontal, forming double loops near the margin, the reticulations faint; length 4 to 7·5 in., breadth 1·75 to 2·5 in., petiole ·35 in. *Flowers*

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·5 to ·75 in. in diam., campanulate, solitary, rarely in pairs, extra-axillary: pedicels ·2 in. long, bracteolate at the base. *Sepals* very small, semi-orbicular. *Outer petals* slightly larger than the sepals and about ·1 in. long; inner petals united at the base, oblong-ovate, sub-acute, ·5 to ·7 in. long, 4 or 5 nerved. *Anthers* numerous, flattened from front to back, about as broad as long with truncate not apiculate heads. *Ovaries* numerous, elongate, narrow, 2-ovuled: stigmas elongate. *Ripe carpels* sub-globular, ·5 in. in diam.: stalks ·5 to ·7 in. *Seeds* two, plano-convex, pale.

South Andaman, King's Collector.

This is a very distinct species recognisable at once by the unusual character of having its petals united at the base and by its 2-seeded carpels.

### 22. Miliusa, Leschenault.

Trees or shrubs. *Flowers* usually bi-sexual (dicœcious or polygamous in No. 1), green or red, axillary or extra-axillary, solitary, fascicled or cymose. *Sepals* 3, small, valvate. *Petals* 6, valvate in 2 series; outer smaller, like the sepals; inner cohering when young by the margins, at length free. *Torus* elongated, cylindric. *Stamens* definite or indefinite; anthers subdidymous; cells contiguous, ovoid, extrorse; connective more or less apiculate. *Ovaries* indefinite, linear-oblong; style oblong or very short; ovules 1–2, rarely 3–4. *Ripe carpels* globose or oblong, 1- or 2- or many-seeded.—Distrib. Species 8; all Indian.

| | | |
|---|---|---|
| Flowers dicœcious or polygamous | ... | 1. *M. Roxburghiana.* |
| Flowers hermaphrodite ... | ... | 2. *M. longipes.* |

1. Miliusa Roxburghiana, Hook. fil. and Thoms. Fl. Ind. 150. A small tree; young branches softly pubescent, ultimately glabrous, striate and pale. *Leaves* thinly coriaceous, oblong or oblong-lanceolate, shortly acuminate, the base rounded; upper surface glabrous, the lower sparsely adpressed, pubescent to tomentose; main nerves about 10 pairs, spreading, inter-arching ·15 in. from the base; length 2·5 to 4 in., breadth ·85 to 1·4 in.; petiole ·05 in., pubescent. *Pedicels* 1 to 3 together, axillary, slender, ·5 to 1·5 in. long, sometimes on a short peduncle; bracteoles several, linear. *Flowers* dicœcious or polygamous, about ·5 in. long. *Sepals* and outer petals subequal, lanceolate or linear, rusty-tomentose. *Inner petals* ·5 to ·6 in. long, ovate or oblong-lanceolate, sub-acute, nerved, red. *Stamens* in male flower numerous, with obliquely truncate, broad apices. *Ovaries* (in female flower) oblong, glabrous; style oblong ovules 1 or 2. *Ripe carpels* ovoid or oblong, blunt, glabrous, granulate, ·25 to ·35 in. in diam.; stalk ·4 in. long, slender. *Seeds* 1, rarely 2. Hook. fil. Fl. Br. Ind. I, 87; Kurz F. Flora Burma, I, 47. *M. Wallich-*

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*iana*, H. f. and T. l. c. 149. *M. tristis*, Kurz F. Flora Burma, I, 47; *Uvaria dioica*, Roxb. Fl Ind. ii. 659. *Phœanthus dioicus*, Kurz in Flora LIII. (1870) 274. *Guatteria globosa*, A. DC. Mem. Soc. Genev. V, 43; Wall. Cat. 6448. *Hyalostemma Roxburghiana*, Wall. Cat. 6434; Griff. Ic. Pl. Ind. Or. iv. t. 653.

Sikkim, Himalaya; Assam Hill ranges; Chittagong Hills: Burma; Singapore up to 4,000 feet.

Kurz's species *M. tristis*, (F. Flora Burma, I, 47) appears to be a form of this with larger leaves and flowers than usual. The only specimens of it extant are very poor and better material may shew it to be, as Kurz thought, a distinct species. According to M. Pierre, his Cambodian species *M. mollis* (Fl. Forest. Coch.-Chine, t. 40) is closely allied to *M. Roxburghiana*. The same author's species *M campanulata* (l. c. t. 41) is also allied to *M. Roxburghiana* and to *M. macrocarpa*.

2, Miliusa longipes, King, n. sp. A small tree 15 to 30 feet high: young branches dark-coloured; all parts glabrous except the edges of the sepals and outer petals. *Leaves* membranous, shining, oblong-oblanceolate, acuminate, the base sub-cuneate or rounded; main nerves about 12 pairs, spreading, faint: length 5·5 to 7 in., breadth 1·75 to 2·75 in., petiole ·1 to ·15 in. *Flowers* ·5 to ·65 in. long, axillary, solitary; pedicels slender, ·5 to ·75 in. long, (larger in fruit) with 3 or 4 lanceolate bracteoles at the base. *Sepals* and *outer petals* sub-equal, minute, ovate, sub-acute, the edges ciliate. *Inner petals* very much larger than the outer, ovate-oblong, veined, sub-acute, greenish-yellow, ·5 or ·6 in. long. *Stamens* about 18, compressed, short, often bent, the apiculus broad, shallow. *Ovaries* numerous, elongate, glabrous; *stigma* large, capitate, sessile. *Ripe carpels* numerous, globular-ovoid, blunt, glabrous, subgranular, ·25 to ·3 in. long; stalks ·75 to 1 in., slender. *Seeds* ovoid.

Perak: at low elevations, Scortechini, King's Collector.

This species approaches *M. macropoda*, Miq: but its leaves are more narrowed to the base and more acuminate.

### 23. Alphonsea, H. f. & T.

Lofty trees. *Leaves* more or less coriaceous, glabrous, shining. *Flowers* small or middle-sized, in leaf-opposed, rarely extra-axillary, peduncled fascicles; buds conical. *Sepals* 3, small, valvate. *Petals* 6, valvate in 2 series, often saccate at the base, larger than the sepals, equal or the inner rather smaller. *Torus* cylindric or hemispheric. *Stamens* indefinite, loosely packed; anther-cells dorsal, contiguous; connective apiculate. *Ovaries* 1 or more; style oblong or depressed; ovules 4–8, in 2 series on the ventral suture. *Carpels* sub-sessile or stalked.—Distrib. Species 9, all Indian or Malayan.—Baillon Hist. 215 unites this genus with *Bocagea*.

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Leaves rusty-pubescent beneath at all stages ... 1. *A. Maingayi.*
Leaves glabrous on both surfaces (puberulous on the lower in *A. elliptica*).
Leaves more than 3 inches long.
Buds conical; ripe carpels ovoid or globose.
Leaves glabrous on the upper surface, puberulous on the lower when young, elliptic or ovate-elliptic; main nerves 6 to 8 pairs 2. *A. elliptica.*
Leaves quite glabrous, broadly elliptic, shortly acuminate: main nerves 7 to 8 pairs ... ... 3. *A. lucida.*
Buds globose; ripe carpels cylindric ... 4. *A. sub-indehiscens.*
Leaves 3 inches long or less: ripe carpels cylindric ... ... ... 5. *A. cylindrica.*
Of uncertain position (fruit unknown)... 6. *A. Curtisii.*

1. Alphonsea Maingayi, Hook. fil. and Thoms. Fl. Br. Ind. I, 90. A tree: branches rusty-tomentose, ultimately dark-coloured and glabrous. *Leaves* coriaceous, elliptic-oblong or oblong-lanceolate, shortly, and often obtusely, acuminate, the base rounded; upper surface shining, glabrous except the midrib, puberulous near the base; lower surface rusty, conspicuously reticulate, pubescent, the midrib tomentose; main nerves 8 or 9 pairs, oblique, inter-arching far from the edge; length 5 to 7 in., breadth 1·5 to 2·7 in., petiole ·25 in. *Flowers* ·75 in. in diam., supra-axillary, solitary or in small racemes; pedicels ·1 in. long, rusty-tomentose, bracteole small. *Sepals* sub-orbicular, very small. *Petals* ovate, pubescent outside, glabrous within, the outer recurved, the inner smaller. *Stamens* with broad short filaments; the anther-cells small, diverging below. *Ovules* about 20. *Ripe carpels* ovoid, short-stalked, 2 in. long, by 1 in. in diam. *Seeds* many, smooth.

Malacca, Maingay (Kew Distrib.) No. 98.

2. Alphonsea elliptica, Hook. fil. and Thoms. Fl. Br. Ind. I, 90. A tree? Young branches rather stout, grey, glabrous. *Leaves* coriaceous, elliptic or ovate-elliptic, shortly and bluntly acuminate or acute, the base abruptly cuneate; upper surface glabrous, shining; the lower reticulate, puberulous when young, glabrous when adult, slightly paler than the upper; main nerves 6 to 8 pairs, spreading, slightly prominent beneath; length 3·5 to 5 in., breadth 1·25 to 1·75 in., petiole ·2 in. *Flowers* ·8 in. in diam., axillary, solitary or 2 to 3, in short racemes; peduncles very short, multi-bracteate, pedicels ·25 to ·35 in. long, with 1 or 2 minute bracteoles. *Sepals* sub-orbicular, obtuse, recurved, con-

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nate at the base. *Petals* adpressed-pubescent; the outer ovate-lanceolate, reflexed: the inner rather smaller. *Stamens* in several rows, apiculate. *Ovaries* linear-oblong, pubescent; stigma sub-sessile, sub-capitate. *Ovules* numerous, in two series. *Ripe carpels* unknown.

Malacca; Maingay (Kew Distrib.) No. 99.

3. ALPHONSEA LUCIDA, King, n. sp. A shrub 6 to 8 feet high: all parts glabrous except the flower; young branches slender, rather dark-coloured. *Leaves* thinly coriaceous, broadly elliptic, shortly, abruptly and rather obtusely acuminate, the base cuneate; under surface very minutely scaly; main nerves 7 or 8 pairs, oblique, curving, depressed on the upper, bold and prominent on the lower, surface; length 4·5 to 5·5 in., breadth 1·75 to 2·5 in.; petiole ·3 in., stout. *Flowers* extra-axillary, solitary or 2 or 3 in racemes: peduncle of raceme short, pedicels shorter than the peduncle, puberulous, ebracteolate, ·3 to ·4 in. long. *Sepals*, triangular-ovate, connate at the base, reflexed, puberulous outside, glabrous inside. *Petals* yellowish-white, subequal, oblong, oblique, tapering gradually to the sub-acute apex, the base broad, suddenly narrowed and slightly pouched, puberulous, ·5 in. long, the inner slightly smaller. *Stamens* in 3 rows; filament very short, connective with a short apiculus. *Ovaries* 4 or 5, oblong, adpressed-pubescent; ovules many, in two rows: stigma sessile, sub-capitate. *Ripe carpels* unknown.

Perak: elevat. 500 feet. King's Collector, No. 5387.

4. ALPHONSEA SUB-DEHISCENS, King, n. sp. A shrub or small tree: young branches rather slender, puberulous at first but speedily becoming glabrous. *Leaves* thinly coriaceous, oblong-lanceolate to elliptic, shortly and rather bluntly acuminate, the base rounded or sub-cuneate; upper surface glabrous except the puberulous midrib, the lower reticulate, sparsely puberulous or glabrous; main nerves about 10 pairs, spreading, very faint; length 4 to 6 in., breadth 1·75 to 2·3 in.; petiole ·25 in. *Flowers* globular, scarcely opening, ·25 in. in diam., solitary or in pairs, slightly supra-axillary, on short pedicels, with several large sub-orbicular pubescent bracteoles. *Sepals* thick, fleshy, connate into a flat cup, ·3 in. in diam., with three broad obtuse, spreading lobes. *Petals* larger than the sepals, thick, hard and fleshy, valvate, orbicular, acute, concave, outside tawny-pubescent, inside glabrous except near the apex; the outer ·2 in. in diam., the inner row rather smaller than the outer. *Stamens* numerous; the apical process large, fleshy, conical, concealing the apices of the narrow, linear anther cells: torus conical. *Pistil* solitary, clavate, minutely puberulous, many-ovuled: stigma minute. *Ripe carpels* elongate-clavate, puberulous, 1 to 1·25 in. long, tapering into a stalk, ·25 to ·3 in. long. *Seeds* about 10.

Perak: King's Collector.

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The dried fruits of this species sometimes open longitudinally by a sort of quasi-suture—hence the specific name.

5. ALPHONSEA CYLINDRICA, King, n. sp. A small tree 20 to 30 feet high; young branches with long, soft, pale brown pubescence, ultimately glabrous, cinereous, striate, *Leaves* thinly coriaceous, ovate-lanceolate, sometimes oblanceolate, shortly and bluntly acuminate; the base rounded or sub-cuneate, slightly oblique; upper surface glabrous, shining; the midrib pubescent, the lower dull sparsely pubescent on the midrib and nerves; main nerves 7 to 9 pairs, spreading, faint; length 2·5 to 3·5 in., breadth 1·1 in. to 1·5. in., petiole ·15 in. *Flowers* ·35 in. long, single or 2 or 3 from leaf-opposed or extra-axillary peduncles; peduncles ·15 to ·4 in. long, with deciduous, distichous, sub-orbicular bracts: pedicels 2 to ·35 in. long, pubescent, with 1 bracteole near the base. *Sepals* semi-orbicular, blunt, connate at the base, tomentose outside, glabrous within, reflexed. *Petals* subequal, oblong-ovoid, tapering from the sub-saccate base to the sub-acute apex, tomentose outside, pubescent minutely inside except a glabrous patch at the base, 4 in. long. *Stamens* in 3 rows with short, broad filaments: anthers ovate, the connective very slightly apiculate. *Ovaries* 3, oblong, densely pale yellowish sericeous, with many ovules in two rows: style short, stigma bifid, sub-capitate. *Ripe carpels* 1 or 2, elongate, terete, tapering to the apex, pubescent or puberulous, nearly 1 in. long and only ·2 in. in diam.

Perak: on Ulu Bubong, elevat. 400 to 600 feet. King's Collector, No. 10633.

A species resembling *A. sub-dehiscens* in its narrow cylindric fruit.

6. ALPHONSEA CURTISII, King, n. sp. A scandent shrub: young branches yellowish-pubescent, speedily becoming glabrous and dark-coloured. *Leaves* coriaceous, oblong-lanceolate, acute at base and apex; upper surface glabrous shining, the lower minutely, sparsely adpressed-puberulous or glabrous, darker than the upper when dry, minutely reticulate; main nerves about 12 to 15 pairs, sub-horizontal, very faint, inter-arching far from the edge; length 4 to 5·5 in., breadth 1·2 to 1·75 in., petiole ·2 in. *Peduncles* extra-axillary, 1- or 2-flowered; flowers about ·5 in long, conical in bud: pedicels about ·3 in. long, tawny-tomentose; bracteoles 1 or 2, sub-orbicular. *Sepals* connate into a spreading cup, ·25 in. broad, tomentose outside and glabrous inside, with 3 broad, sub-acute teeth. *Petals* much larger than the sepals, fleshy, oblong, ovate, sub-acute; the outer tomentose on both surfaces, ·4 in. long; the inner narrower, glabrous inside. *Stamens* numerous, with short thick filaments: apical process of connective small, not concealing the short perfectly dorsal anther-cells. *Pistils* about 3, oblong, tomentose, many-ovuled: stigma large, broad, sessile. *Ripe carpels* unknown.

Penang: Curtis, No. 1410.

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### 25. Kingstonia, H. f. and T.

Trees. *Flowers* fascicled on cauline tubercles, bisexual. *Sepals* 3, persistent, ovate, acute, the bases connate. *Petals* 6; outer valvate; inner smaller, oblong, imbricate. *Stamens* about 12, the filament half the length of the extrorse anther-cells; connective obliquely truncate. *Ovary* 1; stigma sessile, peltate, crenate: ovules few. *Ripe carpels* globose. *Seeds* several, 2-seriate.

1. Kingstonia nervosa, Hook. fil. and Thoms. Fl. Br. Ind. I, 93. Young branches rusty-pubescent. *Leaves* thinly coriaceous, oblong, rarely elliptic, shortly acuminate, the base rounded; both surfaces glabrous, the nerves and midrib puberulous beneath when young; main nerves 12 to 14 pairs, oblique, rather straight, depressed on the upper, strong and prominent on the lower, surface; length 4 to 8 in., breadth 1·5 to 3·25 in.; petiole ·4 in., puberulous. *Flowers* ·25 in. long, in extra-axillary fascicles of 8 or 10: pedicels ·35 to ·5 in., slender, rusty-pubescent; bracteoles orbicular, one close to the flower, the others basal and imbricate. *Sepals* ovate, connate at the base, spreading, pubescent outside, glabrous within. *Outer petals* oblong-elliptic, concave, obtuse, cinereous-tomentose outside, pubescent inside; *inner petals* smaller, thick, concave and very tomentose, in the upper half. *Stamens* about 15, the connective with a broad truncate apex. *Ovary* one, oblong, angled, pubescent; ovules 4 to 6. *Ripe carpels* broadly ovoid, blunt, minutely velvety pale-rusty tomentose, 1·5 in. long and 1·1 in. in diam.; pericarp woody. *Seeds* about 4, oblong, compressed, separated by dissepiments.

The species above described has only a single pistil. But there are, in the Calcutta Herbarium, specimens from Sumatra (Forbes No. 2713, in fruit but without flower) of what appears to be a second *Kingstonia*, and in these there are two carpels. If this plant proves to be a *Kingstonia*, the diagnosis of the genus will have to be amended.

Malacca: Maingay, (Kew Distrib.) No. 22. Perak: Wray, No. 3376.

### 26. Mezzettia, Beccari.

Trees. *Flowers* small, greenish, axillary or from the axils of fallen leaves, fasciculate or umbellate. *Sepals* 3, ovate, valvate. *Petals* 6, valvate, opening late and accrescent, flat, linear, the inner petals smaller than the outer. *Stamens* 9 to 12, in two rows; anther-cells lateral, introrse; connectives produced beyond their apices, truncate. *Torus* small, slightly concave, pubescent. *Ovary* solitary, ovate, glabrous, contracted into a very short style; stigma sub-capitate; ovules 2, superposed. *Carpel* coriaceous, elliptic or globose. *Seeds* 2, large, compressed. Five species, all Malayan.

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1. Mezzettia leptopoda, Oliver in Hook. Ic. Pl. t. 1560. A tree: young branches dark-coloured, glabrous, striate, rather stout. *Leaves* coriaceous, oblong or narrowly elliptic, obtusely acuminate or acute; the base rounded or acute; upper surface glabrous, shining; the lower dull, obscurely reticulate; main nerves 8 or 9 pairs, forming wide arches far from the margin, very faint; length 2·5 to 4 in., breadth 1 to 1·75 in., petiole ·35 in. *Flowers* ·5 in. long, on long slender pedicels in axillary fascicles of 2 to 6; pedicels ·5 to ·75 in., pubescent: bracteoles minute. *Sepals* broadly ovate, connate at the base, tomentose, reflexed. *Petals* tomentose, on both surfaces; the outer linear, obtuse, ·2 in. long; the inner shorter and broader. *Ovary* ovoid. *Ripe carpels* unknown, *Lonchomera leptopoda*, H. f. and Th. Fl. Br. Ind. I, 94.

Malacca: Maingay (Kew Distrib.) No. 102.

This plant is very imperfectly known. The carpels associated with Maingay's specimens do not agree with his description of them (Fl. Br. Ind. I, 94) and they are evidently those of some species of *Polyalthia*.

2. Mezzettia Herveyana, Oliver Hook. Ic. Plant. t. 1560. A tree; young branches rather stout, nodose, glabrous. *Leaves* coriaceous, elliptic-oblong, shortly acuminate, the base cuneate, both surfaces glabrous, the upper shining; main nerves about 10 pairs, spreading, inter-arching within the margin, faint; length 2·5 to 3 in., breadth 1 to 1·25 in., petiole ·25 to ·35 in. *Flowers* ·4 in. long, rather crowded, in sessile axillary or extra-axillary fascicles of 3 to 8: pedicels ·3 in. long, puberulous, ebracteolate. *Sepals* broadly ovate, obtuse, connate at the base, pubescent like the petals. *Outer petals* ovate-lanceolate, obtuse, flat, the inner smaller, broadly elliptic, obtuse, the tips incurved. *Anthers* sessile, obovate-quadrate, about 12. *Ovary* oblong, tapering into the style: ovules 2, superposed. *Ripe carpels* unknown.

Malacca: Hervey.

3. Mezzettia Curtisii, King n. sp. A tree, 30 to 40 feet high: young branches cinereous, rugose. *Leaves* thinly coriaceous, oblong-lanceolate or oblong, more or less acuminate, the base acute; both surfaces glabrous; the upper shining, the lower dull; main nerves about 10 pairs, spreading, faint; length 2·5 to 5 in., breadth ·5 to 1·5 in., petiole ·25 in. *Flowers* ·25 in. long, in crowded, sessile, axillary or extra-axillary fascicles of 5 to 10; pedicels slender, ebracteolate, scurfily pubescent, ·35 to ·6 in. long. *Sepals* semi-orbicular, with reflexed tips, connate and forming a spreading, shallow cup, densely and minutely tomentose. *Outer petals* ligulate, acute, tomentose like the sepals but with a glabrous patch at the base inside. *Inner petals* like the outer, but less acute and one-third shorter. *Stamens* about 12, short, about as broad as long, the connective very broad, truncate at the apex. *Ovary* solitary, broadly ovoid,



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tapering to the curved, truncate stigma, 2-ovuled. *Ripe carpels* unknown.

Penang, on Government Hill at 1,200 feet; Curtis, No. 2266.

A species with rather longer, thinner leaves than *M. Herveyana*, and a different calyx.

II.—Noviciæ Indicæ V. *An undescribed* Mezoneuron *from the Andaman Group.—By* D. Prain.

When in the Andamans in 1889 and again in 1890 and 1891 the writer met with a species of *Mezoneuron* which occurs rather frequently in the neighbourhood of Port Blair and which has not hitherto been described. During each of these visits only fruiting specimens were obtained; at length, however, the native collectors who are under the care of Mr. E. H. Man have sent flowering specimens to Calcutta. The subjoined synopsis, in which the position of the new species among the Indian *Mezoneura* described by Mr. Baker, in the *Flora of British India*, 257–259, is shown, is followed by a description of the plant.

MEZONEURON, Desf.

| | |
|---|---|
| Calyx deeply cleft, disk basal (§ Eumezoneuron) filaments hirsute:— | |
| pods one-seeded, filaments faintly ciliate; leaflets glabrous, rigid, opposite, 8–10, large, ovate, acute; calyx glabrous ... | *M. cucullatum.* |
| pods several-seeded, filaments densely pilose:— | |
| leaflets glabrous:— | |
| leaflets rigid, alternate, 8–10, large, obovate, retuse; calyx glabrous | *M. andamanicum.* |
| leaflets membranous:— | |
| leaflets alternate, 14–16, small, oblong, obtuse; calyx externally puberulous ... | *M. glabrum.* |
| leaflets opposite, 18–22, small, oblong, obtuse; calyx glabrous | *M. enneaphyllum.* |
| leaflets pubescent; membranous, opposite, 12–16, oblong, obtuse; calyx externally and internally pubescent ... | *M. pubescens.* |
| Calyx shallowly cleft, disk extending above the base (§ Tubicalyx); filaments glabrous, pods several seeded; leaflets glabrous, rigid, opposite, 8–10, large, obovate-oblong; calyx glabrous ... | *M. sumatranum* |

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Baker describes the calyx of *M. glabrum* as glabrous, but both by his diagnosis and figure Desfontaine (*Mem. Mus.* iv, 246, t. 10) indicates that the calyx is tomentose; the writer has not seen any flowering specimens.

MEZONEURON ANDAMANICUM Prain, sp. nov.

A large climber, branches glabrous with a few pale, scattered prickles. Leaf rachis 1–1½ ft., pinnae 4–10, long-stalked, leaflets 8–10, rigidly subcoriaceous, ½–1½ in. long, alternate, obovate, slightly retuse, base cuneate, glabrous on both surfaces, dark green above, paler below. *Racemes* unbranched, 10–12 inches long, pedicels ¼–¾ in. long. *Calyx* leathery, anterior sepal ¼ in. long, deeply cucullate, the others ¾ in. diam., orbicular, all green and delicately reticulately yellow-veined, the interspaces dotted with yellow glands. *Petals* yellow with base and veins reddish, ovate-orbicular, the lateral and anterior pairs subequal and only slightly larger than the lateral and posterior sepals, with very short claws, slightly hirsute internally, the inner and upper (vexillary) petal with a lamina less than ⅓ the size of the others, with a thick claw as long as the blade, channelled internally and prolonged at the base of the lamina into a ligular ridge, densely ciliate at its margin, which rests in the angle formed by the declinate filaments. *Stamens* declinate, in two rows, the outer row (5) with lowest stamen single, longer than the rest, curved, the lateral rather shorter, also curved; the upper pair abruptly angularly bent, with the portion of the filaments below the angle thrice as thick as the other filaments and filling up the channel in the claw of the vexillum, the upper portion not thicker than the other filaments, bent backwards over the vexillary ligule. The inner row (5) with upper vexillary stamen smallest of all, simply, declinately curved as are the other four; all filaments densely pilose in the lower 2/3 rds. *Ovary* declinate, about 6-ovuled; style long, stigma terminal, concave, tip slightly fringed. *Pod* thin, 5 inches long, 1 inch wide (including the posterior wing ¼ in. wide) finely reticulated, 3–5 seeded; seed flat, orbicular, embryo exalbuminous, with flat cotyledons and straight radicle.

SOUTH ANDAMAN; near Port Blair at Protheropur, Rangachang, etc., *Prain! King's Collectors!*

FL. January—February.

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# JOURNAL

OF THE

# ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE.

No. II.—1892.


## I.—*Catalogue of the* Diptera *of the Oriental region by* Mons. J. M. F. Bigot. Part II. *Communicated by the* Superintendent, Indian Museum.*


Received Sept. 25th, 1891. Read Nov. 4th, 1891.


### Sub-division Anempodiata.

J. Bigot, *adhuc ined.*

### Family MIDASIDÆ.

Mydasid. Leach, *Edinb. Encyclop.* 1815; Mydas, Latr., *Gener. Crust. et Ins.*, iv, 1809, page 294; Mydasii, Macquart, *S. à Buff. Dipt.*, i, *Paris*, 1834; Midasidæ, Midasina, Rondani, *Prodr.*, i, p. 14, 1856.

### Genus Midas.

Mydas, Fabr., *Entom. Syst.*, iv, p. 252, 1794; Nemotelus pt. Degeer; Bibio. pt. Fabr.

**ruficornis**, Wiedemann, *Analect. Entomol.*, p. 20.
Hab. Tranquebar, Madras Pr.

### Family DASYPOGONIDÆ.

J. Bigot, *adhuc ined.*; Dasypogonina, Rondani, *Prodr.*, i, p. 32, 1856.

* In Parts II and III of this Catalogue all species not belonging to the Oriental Region have been struck out. It has also been found necessary to correct many of the references.—Ed.




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## Genus Dasypogon.

Meigen, *Illig. Magaz.*, ii, p. 270, 1803 ; Asilus, pt. Erax, pt. Scopoli ; Cheilopogon, pt. Rond.

**nigricauda**, Wiedemann, *Analect. Entomol.*, p. 26 ; Microstylum, id. Macq.
Hab. India.

**virens**, id., *Auss. Europ. Zweifl. Ins.*, i, p. 398, *Hamm*, 1828.
Hab. Java.

**albonotatus**, id., ibid., p. 181 ; Dioctria, id., Wied. *Dipt. Exot.*, i, p. 181.
Hab. Bengal.

**dorsalis**, id., ibid., ♀. 413.
Hab. India.

**incisus**, Macquart. *Dipt. Exot. 5th Suppl.* p. 49, *Paris*, 1855.
Hab. India.

**pekinense**, J. Bigot, *Ann. Soc. Ent. France*, p. 410, 1878.
Hab. China.

**imberbis**, Doleschall, *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1856, p. 408.
Hab. Java.

**imbutus**, Walker, *Insect. Saunders. Dipt.*, i, p. 96, *London*, 1856.
Hab. India.

**apiformis**, id., ibid., p. 97.
Hab. India.

**trimelas**, id., ibid., p. 97.
Hab. India.

**pulverifer**, id., ibid., p. 98.
Hab. India.

**volcatus**, id., *List. Dipt. Ins. Brit. Mus.*, i, p. 346, *London*, 1848.
Hab. India.

**sordidus**, id., ibid., vi, *addenda*, i, p. 505, 1854.
Hab. China.

**hypsaon**, id., *List. Dipt. Ins. Brit. Mus.*, i, p. 348, *London*, 1848.
Hab. China.

**cerco**, id., ibid., p. 349.
Hab. Hongkong.

**subauratus**, id., ibid., vi, p. 470, 1854.
Hab. China.

**ambryon**, id., ibid., i, p. 311, 1848.
Hab. Bengal.

**damias**, id., ibid., i, p. 313.
Hab. Bengal.

**aphrices**, id., ibid., i, p. 314.
Hab. Nepal.

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**echelus**, id., ibid., i, p. 314.
Hab. Nepal.

**imbrex**, id., ibid., i, p. 315.
Hab. Nepal.

**inopinatus**, Walker, *Trans. Ent. Soc. London*, 1860, (2) v, p. 278.
Hab. Burma.

**inopportunus**, id., ibid., p. 278.
Hab. Burma.

**decretus**, id., ibid., p. 279.
Hab. Burma.

**proclivis**, id., ibid., p. 277.
Hab. Burma.

**polygnotus**, id., *List. Dipt. Ins. Brit. Mus.* i, p. 305, *London*, 1848.
Hab. Sylhet.

**rhypæ**, id., ibid., p. 305.
Hab. Sylhet.

**balbillus**, id., ibid., p. 307.
Hab. Nepal.

**sura**, id., ibid., p. 345.
Hab. India.

**scatophagoides**, id., ibid., vi, p. 475, 1854.
Hab. India.

**libo**, id., ibid., i, p. 342, 1848.
Hab. India.

**otacilius**, id., ibid., p. 344.
Hab. India.

**lanatus**, Doleschall, *Naturk. Tidschr. Nederl. Indie, Batavia*, 1857, p. 392.
Hab. Java.

### Genus Saropogon.

Loew, *Linn. Entom.*, ii, p. 439, 1847; Dasypogon, pt.

**scalare**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 413.
Hab. India.

### Genus Lochites.

Schiner, *Verhandl. K. K. z. b. Gesellsch., Wien*, p. 671, 1866.

**testaceus**, J. Bigot, *Ann. Soc. Ent. France*, p. 425, 1878.
Hab. Burma.

### Genus Leptogaster.

Meigen, *Illig. Magaz.*, ii, p. 269, 1803; Gonypes, Latr. *Gen. Crust. et Ins.*, vol. iv, p. 301, 1809; Asilus pt. Degeer; Dasypogon, pt.

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**nutilis**, Walker, *Journ. Proceed. Linn. Soc., London*, 1857, i, p. 117.
Hab. Borneo.

**vitiosus**, V. d. Wulp, *Tijdschr. Entom.*, Hague, 1872, p. 137.
Hab. Java.

**macilentus**, id., ibid., p. 139.
Hab. Java.

**levis**, id., ibid., p. 140.
Hab. Sumatra.

**varipes**, id., ibid., xxiii, 1880, p. 166.
Hab. Padang.

**simplex**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 444.
Hab. Ceylon.

**marion**, Walker, *List. Dipt. Ins. Brit. Mus.* ii, p. 484, *London*, 1849.
Hab. Bengal.

**tricolor**, id., *Journ. Proceed. Linn. Soc., London*, i, 1856, p. 117.
Hab. Borneo.

## Genus Microstylium.

Macquart, *Dipt. Exot.*, i, 2nd pt., p. 26, *Paris*, 1838; Dasypogon, pt. Megapollion, pt. Walker, 1830.

**apicalis**, Macquart, *Dipt. Exot.*, i, 2nd pt., p. 27, *Paris*, 1838; Dasypogon id., Wiedem. *Auss. Europ. Zweiflug. Ins.*, i, p. 372, *Hamm*, 1828.
Hab. Bengal.

**sinense**, id., ibid., p. 29; Dasypogon id. Fabr. *Syst. Antl.*, p. 169; Dasypogon dux, Wied. *loc. cit.*, p. 568.
Hab. China.

**spinitarsis**, id., ibid., 4th *Suppl.*, p. 61, 1850.
Hab. Sylhet.

**brunnipenne**, id. ibid., p. 62.
Hab. Sylhet.

**bicolor**, id. ibid., p. 62.
Hab. Sylhet.

**flaviventre**, id., ibid., p. 62.
Hab. Sylhet; China.

**amoyense**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 401.
Hab. Amoy.

**erytropygum**, (*Melius erytropygatum*), id., ibid., p. 402.
Hab. Assam.

**basirufum**, id., ibid., p. 403.
Hab. Assam.

**brevipennatum**, id., ibid., p. 403.
Hab. India.

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**eximium**, id., ibid., p. 404.
Hab. Burma.

**hæmorrhoidale**, id, ibid., p. 404.
Hab. Burma.

**nitidiventris**, id., ibid., p. 405.
Hab. Burma.

**nigrum**, id., ibid., p. 405.
Hab. Cambodia.

**indutum**, Rondani, *Ann. Mus. Civ. Genova*, 1875, vii, p. 446.
Hab. Sarawak.

**vestitum**, id., ibid., p. 447.
Hab. Sarawak.

**incomptus**, Walker, *Journ. Proceed. Linn. Soc. London*, 1857, i, p. 112.
Hab. Borneo.

**vica**, id., ibid., p. 112.
Hab. Sylhet, Borneo.

## Genus Damalis.

Fabr., *Syst. Antl.*, p. 148, 1805; Dioctria, pt. Chalcidimorpha, pt. Westw.

**myops**, Fabr., *Syst. Antl.*, p. 148, 1805; Chalcidimorpha id. Westw.
Hab. Sumatra.

**tibialis**, Macq. *Dipt. Exot.* i, 2nd pt., p. 154, *Paris*, 1838.
Hab. India.

**planiceps**, Fabr., *Syst. Antl.*, p. 148, 1805.
Hab. Tranquebar.

**andron**, Walker, *List Dipt. Ins. Brit. Mus., London*, i, p. 480, 1848.
Hab. Hongkong.

**fuscus**, id., ibid., p. 481.
Hab. Bengal.

**fumipennis**, id., ibid., vii, 3rd *Supplt.*, p. 765.
Hab. Java.

**signatus**, id., *Trans. Ent. Soc., London, Vol. V*, 1858–61, p. 284.
Hab. Burma.

**maculata**, Wiedem., *Ausser. Europ. Zweifl. Ins.* i, p. 416, *Hamm.*, 1828.
Hab. Java.

**saigonensis**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 443.
Hab. Saigon.

**marginata**, V. d. Wulp, *Tijdschr. Entomol.*, 1872, p. 142.
Hab. Borneo.

**major**, id., ibid., p. 143.
Hab. Borneo.

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**pallida**, id., ibid., p. 145.
Hab. Borneo, Sumatra.

**felderi**, Schiner, *Verhandl. K. K. z. b. Gesellsch., Wien*, 1867, p. 365.
Hab. Ceylon.

**grossa**, id., *Novarr. Reise*, 1868, p. 161.
Hab. Hongkong.

### Genus Stichopogon.

Loew, *Linn. Entom.*, ii, 1847, p. 499; Dasypogon, pt.

**albicapillus**, V. d. Wulp, *Tijdschr. v. Entom.*, (2) vii 1872, p. 147.
Hab. Java.

**nicobarensis**, Schiner, *Novara. Reise.*, 1868, p. 161.
Hab Nicobar Islands.

### Genus Laphyctis.

Loew, *Conspect. Act. Acad R. Sueciæ*, xv, 1859, p. 337.

**stigmaticalis**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 430.
Hab. Ceylon.

### Genus Cyrtopogon.

Loew, *Linn. Entom.*, ii, 1847, p. 516; Dasypogon, pt.

**laphrides**, Walker, *Ins. Saunders. Dipt.*, i, p. 99, *London* 1856.
Hab. India.

**scatophagoides**, id, *List. Dipt. Ins. Brit. Mus.* vi, 2nd *Supplt.* p. 475, *London* 1854.
Hab. India.

### Genus Xyphocera.

Macquart, *S. à Buff. Dipt.*, i, p. 279, *Paris* 1834; Dasypogon, pt. Elasmocera, pt. Rondani, *Prodr.* i, 1856.

**percheronii**, id., ibid., p. 280.
Hab. Sumatra.

### Genus Habropogon.

Loew, *Linn. Entom.*, 1847, ii, p. 463; Dasypogon, pt. Dactyliscus pt. Rondani, *Prodr.* i, 1856, p. 158.

**jucundus**, V. d. Wulp., *Bijdr. t. d. Kenn. d. Asilid. v. Ost. Indisch.* Hagua, 1872, p. 148.
Hab. Java.

### Genus Scylaticus.

Loew, *Conspect. Act. Acad. R. Sueciæ*, xiv, 1858, p. 342; Dasypogon, pt.

**vertebratus**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 435.
Hab. Java.

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**degener**, Schiner, *Novara. Reise*, 1868, p. 163.
Hab. Hongkong.

## Family ASILIDÆ.

J. Bigot, *adhuc. ined.* 1891 ; Asilina, Rondani, *Prodr.*, i, p. 32, 1856 ; Asilinæ Schiner, 1862.

### Genus EMPHYSOMERA.

Schiner, *Novarr. Reise*, 1868, p. 195 ; Ommatius, pt.

**spathulata**, id., ibid., p. 195 ; Ommatius id., Doleschall *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1858, p. 89 ; Ommatius platymelas, Walker, *Journ. Proceed. Linn. Soc., London*, 1862, p. 8.
Hab. Amboina, Nicobar Islands.

**conopsoides**, id., ibid., p. 71 ; Ommatius id. Wiedemann, *Aus. Europ. Zweiflug. Ins.* i, p. 422, *Hamm* 1828.
Hab. Sumatra.

**nigra**, id., ibid., p. 195.
Hab. Nicobar Islands.

**peregrina**, V. d. Wulp, *Tijdschr. v. Entom.*, vii, Hague, 1872, p. 255.
Hab. Gilolo, Borneo, Sumatra, Ternate, Amboina.

**femorata**, J. Bigot, *Ann. Soc. Ent. France*, 1875, p. 245.
Hab. Ceylon.

**nigrifemorata**, id., ibid., 1876, *Bulletin*, p. 86.
Hab. Amoy.

### Genus ALLOCOTOSIA.

Schiner, *Verhandl., K. K. z. b. Gesellsch., Wien*, 1866, pp. 665, 845 ; Ommatius, pt.

**aurata**, V. d. Wulp, *Tijdschr. v. Entom.*, (2) vii, 1872, Hague, p. 249 ; Asilus id., Fabr. *Ent. Syst.*, iv, p. 387 ; Dasypogon id., Fabr. *Syst. Antl.*, p. 167 ; Ommatius id., Wiedem. *Dipt. Exot.*, i, p. 213, *Auss. Zweifl.*, i, p. 420 ; Ommatius, id. Macquart *S. à Buff.* i, p. 314 ; *Dipt. Exot.*, i, p. 133, Walker, *List Dipt. Ins. Brit. Mus.* vii p. 759.
Hab. Panjab, India.

**triangulum**, id., ibid., p. 251.
Hab. Java.

### Genus OMMATIUS.

Illiger ; Wiedem., *Ausser. Europ. Zweiflug.*, i, p. 418, *Hamm.*, 1828 ; Asilus et Dasypogon, pt.

**compeditus**, Wiedem., ibid., p. 419.
Hab. India. ?

**leucopogon**, id., *Analect, Entom.*, p. 25.
Hab. India.

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**nanus**, Walker, *Ins. Saunders., Dipt.*, i, *London*, 1856, p. 153.
Hab. India.

**gracilis**, id., *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 14.
Hab. Singapore.

**hecale**, id., *List Dipt. Ins. Brit. Mus.*, ii, p. 476, *London*, 1849.
Hab. Borneo.

**chinensis**, id., ibid., 1849, p. 470; Dasypogon id., Fabr., *Syst. Antl.*, p. 169.
Hab. China.

**spinibarbis**, V. d. Wulp. *Tijdschr. v. Entom.*, p. 265, 1872; Sensu Ost.-Sacken, *Ann. Mus. Civ. Genova*, 1880, p. 425; O. noctifer, Walker, *Journ. Proceed. Linn. Soc. London* iii, 1859, p. 88; Sensu Schiner, *Verhandl, K. K. z. b. Gesellsch., Wien*, 1866, p. 718; O. minor, Doleschall, *Naturk., Tijdsch. Nederl. Indie, Batavia*, 1857, p. 394.
Hab. Borneo, Amboina, Aru Islands, Ternate.

**frauenfeldi**, Schiner, *Novar. Reise*, 1868, p. 193.
Hab. Nicobar Islands.

**fulvidus**, Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, x, 1866, p. 718; Sensu Schiner (*loc. cit.*) Ommatius id. Wied. *Ausser. Europ. Zweiflug. Ins.*, p. 420, *Hamm*, 1828; O. pennus, Walker, *List. Dipt. Ins. Brit. Mus.* ii, p. 469; O. coryphe, Walker, id., ibid.; O. androcles, Walker, ib., ibid., p. 470; Asilus garnoti, Guerin, *Voy. de la Coquille*, pl. xx, fig. 8; Sensu Ost.-Sacken, *Ann. Mus. Civ. Genova* xvi, 1881, p. 424; O. inextricatus, Walker, *Journ. Proceed. Linn. Soc. London*, vi, 1862, p. 21.
Hab. Sumatra, Borneo, Celebes, Amboina, Ceram, Corea, Sandwich Islands.

**pictipennis**, J. Bigot, *Ann. Soc. Ent. France*, 1875, p. 246.
Hab. Pulo-Penang.

**rufipes**, Macq., *Dipt. Exot.*, i, 2nd pt., p 133, Paris, 1838.
Hab. Java.

**dispar**, id., ibid., *Suites du 2nd Suppl.*, p. 28.
Hab. Java.

**taeniomerus**, Rondani, *Ann Mus. Civ. Genova*, 1875, p. 449.
Hab. Sarawak.

**conopsoides**, id., ibid., p. 450.
Hab. Sarawak.

**signinipes**, id., ibid., p. 450.
Hab. Sarawak.

**despectus**, V d. Wulp, *Tijdschr. v. Entom.*, 1872, p. 268.
Hab. Java.

**impeditus**, id., ibid., p. 270.
Hab. Borneo.

**argyrochirus**, id., ibid.,
Hab. Java.

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**insularis**, id., ibid., p. 272.
Hab. Java.

**pinguis**, id., ibid., p. 275.
Hab. Java.

**rubicundus**, id., ibid., p. 276.
Hab. Sumatra, Java and Borneo.

**suffusus**, V. D. Wulp, T*ijd. v. Entom.*, Hague, 1872, p. 271.
Hab. Sangir, Java ? Sumatra ?

## Genus Promachus.

Loew, *Linn. Entom.*, iii, p. 390, 1848; Asilus, pt. Trupanea, pt. Macq. *Dipt. Exot.*, i, 2nd pt., p. 91, *Paris*, 1838.

**marcii**, Schiner, *Verhandl. K. K. z. b. Gesellsch., Wien*, 1866, p. 711; Trupanea id. Macq., *Dipt. Exot.* i, 2nd pt., p. 97, *Paris*, 1838.
Hab. India.

**orientalis**, id., ibid., p. 711; Trupanea id. Macq. *loc. cit* p. 96.
Hab. India.

**rufimistacea**, id., ibid., p. 711; Trupanea id. Macq. *loc. cit.*, *4th Supplt.*, p. 80, *Paris*, 1850.
Hab. Java.

**albopilosus**, id., ibid., p. 711; Trupanea id., Macq., *loc. cit.*, *5th Supplt.*, p. 57.
Hab. China.

**testaceipes**, id., ibid., p. 711; Trupanea id., Macq., *loc. cit. 5th Supplt.*, p. 56.
Hab China.

**viridiventris**, id., ibid., p. 711; Trupanea id., Macq., *loc. cit.*, *5th Supplt.*, p. 58.
Hab. China.

**pallipennis**, id., ibid., p. 711; Trupanea id., Macq., *loc. cit.*, *5th Supplt.*, p. 58.
Hab China.

**heteropterus**, id., ibid., p. 711; Trupanea id., Macq., *loc. cit.* 2nd pt., i, p. 96, 1838.
Hab. Malabar.

**amorges**, id., ibid., p. 711; Trupanea id., Walker, *List. Dipt. Ins. Brit. Mus.*, ii, p. 391, 1849.
Hab. Borneo.

**nicobarensis**, Schiner, *Novar. Reise*, 1868, p. 177.
Hab. Nicobar Islands.

**anicius**, Walker, *List. Dipt. Ins. Brit. Mus.*, vii, *3rd Supplt.*, p. 604, *London*, 1855; Asilus id., Walker, *loc. cit.*, ii, p. 392, 1849.
Hab. China.

**gobares**, id., ibid., p. 604; Asilus id., Walker, *loc. cit.*, 1849, *p.* 420.
Hab. Sylhet.



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**maculatus**, Loew, *Linn. Entom.*, iii, p. 406; Sensu V. d. Wulp, *Tijdschr. Entom.*, 1872, Hague; Asilus id., Fabr., *Syst. Ent.*, p. 794; Asilus id., Wiedem., *Zool. Mag.*, p. 28; Asilus id., Meig., *Syst. Beschr.*, ii, p. 231; Trupanea id., Macq., *Dipt. Exot.*, i, Pt. 2, p. 99, *Paris*, 1838; Trupanea id., Walker, *List. Dipt. Ins. Brit. Museum*, vii, 3rd *Suppl.*, 1855, p. 585.
Hab. India.

**bifasciatus**, V. d. Wulp, *Tijdschr. v. Entom.*, Hague, 1872, p. 223; Trupanea, id., Macq., *Dipt. Exot.*, i, 2nd *Pt.*, p. 98, *Paris*, 1838.
Hab. Java.

**melampygus**, id., ibid., p. 223.
Hab. Java, Celebes.

**leucopareus**, id., ibid., p. 227.
Hab Java.

**inornatus**, id., ibid., p. 231.
Hab. Borneo.

**felinus**, id., ibid., p. 231.
Hab Borneo.

**vittula**, id., ibid., 1879-80, xxiii, p. 167.
Hab. Borneo.

## Genus Alcimus.

Loew, *Linn. Entom*, 1848, iii, p. 391; Trupanea, pt. Macq., *Dipt. Exot.*; Asilus, Pt.

**hospes**, Schiner, *Verhandl. K K. z. b. Gesellsch., Wien*, 1866, p. 712; Asilus id., Wiedem., *Zool. Mag.*, iii, p. 32.
Hab. Tranquebar, Madras Pr.

## Genus Philodicus.

Loew, *Linn. Entom.*, 1848, iii, p. 391; Asilus pt.; Trupanea, pt. Macq., *Dipt. Exot.*

**fuscus**, Schiner, *Verhandl. K. K. z. b. Gesellsch., Wien*, i, 1866, p. 712; Trupanea id., Macq., *Dipt. Exot.*, i, 2nd *Pt.* p. 104, *Paris*, 1838.
Hab. Bengal.

**agnitus**, id., ibid., Asilus id., Wied., *Zool. Mag.*, iii, p. 35.
Hab. Sumatra.

**javanus**, id., ibid., Sensu V. d. Wulp, *Tijdschr. v. Entom.*, 1872, p. 232; Asilus id., Wied., *Zool. Mag.*, iii; Trupanea javana, Macq., *Dipt. Exot.*, i, 2nd pt., p. 98, *Paris*, 1838; et, Trupanea rubritarsata, Macq., *loc. cit.*, p. 98; Asilus perplexus, Wiedem., *Ausser. Europ. Zweifl. Ins.*, i, p. 495, *Hamm*, 1828.
Hab. Java, Sumatra.

**innotabilis**, id., ibid., p. 712; Trupanea id., Walker, *List. Dipt. Ins. Brit. Mus.*, vii, 3rd *Supplt.* p. 604, *London*, 1855.
Hab. Java, Sumatra.

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**externo-testacea**, id, ibid., Trupanea id., Macq., *Dipt. Exot., 4th Supplt.*, p. 81, *Paris*, 1850.
Hab. Java.

**rubritarsatus**, id., ibid., Trupanea id., Macq., *loc. cit.*, i, *2nd Pt.*, p. 99, *Paris*, 1838.
Hab. Java.

**westermanni**, id., ibid., p. 712; Trupanea id., Macq., *loc cit.*, p. 98.
Hab. Java.

**rufibarbis**, id., ibid., Alcimus id., Macq., *loc. cit., Suites du 2nd Supplt.*, p. 25, 1847.
Hab. Java.

**confinis**, id., ibid., Trupanea id., Walker, *List. Dipt. Ins. Brit. Mus.*, vii, *3rd Supplt.*, p. 606, *London*, 1855.
Hab. Java.

**ceylanicus**, Schiner, *Novar. Reise*, 1868, p. 179.
Hab. Ceylon.

**chinensis**, id., ibid., p. 712.
Hab. China.

**rufoungulatus**, id., *Verhandl. K. K. z. b. Gesellsch, Wien*, 1866, p. 712; Trupanea, id., Macq., *Dipt. Exot*, i, *2nd Pt.*, p. 99, *Paris*, 1838.
Hab. Cochinchina.

## Genus Philonicus.

Loew, *Linn. Entom.*, 1849, iv, p. 144; 1849, Asilus pt.

**nigrosetosus**, V. d. Wulp, *Sumatra Expedit.*, p. 24.
Hab. Borneo.

## Genus Trupanea.

Macq., *Dipt. Exot.* i, *2nd part*, p. 91, *Paris*, 1838; Asilus, pt. Philodicus, Philonicus, Promachus, Proctachantus, pt. Loew et auctor.

**flavibarbis**, Macq., id., ibid., p. 96.
Hab. Pondicherry.

**varipes**, id., ibid., p. 97.
Hab. Bengal.

**duvaucelii**, id., ibid., p. 97.
Hab. Bengal.

**bifasciata**, id., ibid., p. 98.
Hab. Java.

**apicalis**, id., ibid., p. 100.
Hab. Cochin China.

**albopilosa**, (*nomen bislectum*), Rondani, *Ann. Mus. Civ. Genova*, v 1875, p. 452.
Hab. Borneo.

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**leucopyga**, Walker, *Trans. Ent. Soc. London*, 1857, p. 129.
Hab. China.

**apivora**, id., ibid., p. 282.
Hab. Burmah.

**inserens**, id., *Journ., Proceed. Linn. Soc. London*, 1857, p. 116.
Hab. Borneo.

**univentris**, id., *Ins. Saunders., Dipt.*, i, p. 114, *London*, 1856.
Hab. India.

**agnita**, id., *List. Dipt. Ins. Brit. Mus.*, vii, *Supplt.*, iii, p. 602, *London*, 1855; Asilus id. Wiedem., *Zool. Mag.*, iii, p. 35.
Hab. Sumatra.

**maculipes**, id., ibid., p. 605.
Hab. Hongkong.

**contracta**, id., *Ins. Saunders., Dipt.*, i, p. 120, *London*, 1856.
Hab. India.

**telifera**, id., ibid., p. 115.
Hab. India.

**sagittifera**, id., ibid., p. 116.
Hab. India.

**calanus**, id., ibid., p. 122.
Hab. India.

## Genus Erax.

Scopoli, *Dipt.*, 1763; Macq. *Dipt. Exot.*, i, 2nd pt., p. 107, *Paris*, 1838; Eristicus, pt. Loew; Asilus, pt.

**rufiventris**, Macq., *Dipt. Exot.*, i, 2nd pt., p. 108, *Paris*, 1838.
Hab. Bengal.

**sinensis**, id., ibid., p. 108.
Hab. China.

**curiatius**, Walker, *List. Dipt. Ins. Brit. Mus.*, vii, *3rd Suppl.*, p. 642, 1855.
Hab. Nepal.

## Genus Asilus.

Linn., *Faun. Suec.*, 1761, p, 469.

**atratulus**, Walker, *List. Dipt. Ins. Brit. Mus.*, *London*, vii, *Supplt.* iii, p. 724, 1855.
Hab. Java.

**chinensis**, Fabr., *Ent. Syst.*, iv, p. 383.
Hab. China.

**annulatus**, id., *Syst. Ent.*, p. 794.
Hab. India.

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**loetus**, Wiedem., *Anal. Entom.*, p. 24.
Hab. India.

**bifidus**, Wiedem., *Ausser. Europ. Zweifl. Ins.*, 1st Part, p. 444, *Hamm*, 1828; Dasypogon, id., Fabr, *Syst. Antl.*, p. 170.
Hab. Tranquebar, Madras Pr.

**pusio**, id., *Zoolog. Mag.*, iii, p. 36.
Hab. India.

**agilis**, id., *Ausser. Europ. Zweifl. Ins.*, 1st Part, p. 456, *Hamm*, 1828.
Hab. Java.

**bengalensis**, Macq., *Dipt. Exot.*, i, 2nd Pt., p. 141, *Paris*, 1838.
Hab. Bengal.

**flavicornis**, id., ibid., p. 142.
Hab. Bengal.

**trifarius**, id., ibid., p. 142.
Hab. Pondicherry.

**claripes**, id., ibid., p. 142.
Hab. Java.

**nudipes**, id, ibid., *2nd Supplt.*, p. 42, 1846.
Hab. India.

**appendiculatus**, id., ibid., *Suites du 2nd Supplt.*, p. 29, 1847.
Hab. Java.

**nigrimystaceus**, id., ibid., *4th Supplt.*, p. 91, 1850.
Hab. Pondicherry.

**rufibarbis**, id., ibid., p. 91.
Hab. Java.

**albibarbis**, id., ibid., p. 91.
Hab. Java.

**ephippium**, id., ibid., *5th Supplt.*, p. 62, 1855.
Hab. Java.

**maculifemora**, id., ibid., p. 62.
Hab. China.

**armatipes**, id., ibid., p. 63.
Hab. China.

**limbipennis**, id., ibid., p. 63.
Hab. China.

**misso**, id., ibid., p. 64.
Hab. China.

**sundaicus**, Jaennicke, *Neu. Exot. Dipt.*, p. 55, *Frankfurt*, 1867.
Hab. Java.

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**shalumus**, Walker, *Trans. Ent. Soc., London*, iv, 1857, p. 131.
Hab. China.

**flagrans**, id., *Journ. Proceed. Linn. Soc., London*, 1857, p. 116.
Hab. Sarawak.

**contortus**, id., ibid., p. 117.
Hab. Sarawak.

**barium**, id., *List. Dipt Ins. Brit. Mus.*, ii, p. 426, *London*, 1849.
Hab. Ceylon, Singapore, Sarawak.

**fusiformis**, id., *Journ. Proceed. Linn. Soc., London*, i 1857, p. 13.
Hab. Malacca.

**lineosus**, id., ibid., p. 13.
Hab. Singapore.

**debilis**, id., ibid., p. 13.
Hab. Malacca.

**latifascia**, id., ibid., p. 14.
Hab. Singapore.

**minusculus**, Rondani, *Ann. Mus. Civ. Genova*, 1875, p. 451.
Hab. Sarawak.

**melanurus**, Doleschall *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1856, p. 408.
Hab. Java.

**barbatus**, id., ibid., 1857, p. 393.
Hab. Amboina.

**penultimus**, id., *Ins. Saunders. Dipt.*, i, p. 134, *London*, 1856.
Hab. India.

**congedus**, id., ibid., p. 138.
Hab. India.

**iamenus**, id., *List. Dipt. Ins. Brit. Mus., London*, ii, p. 428, 1849.
Hab. Bengal.

**paterculus**, id., *Insect. Saunders. Dipt.* i, p. 146, *London*, 1856.
Hab. India.

**præfiniens**, id., ibid., p. 146.
Hab. India.

**apicata**, id., ibid., p. 486.
Hab. Java.

## Genus Antipalus.

Loew, *Linn. Entom.* iv, 1849, p. 136; Asilus, pt.

**wieneckii**, V. der Wulp, *Tijdschr. v. Entom.*, 1872, Hague, p. 238.
Hab. Timor, Java.

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### Genus Synolcus.

Loew, *Consp. Act. Acad. R. Suecia*, xiv, p. 342, 1858; Asilus pt.

**xanthopus**, V. der Wulp, *Tijdschr. v. Ent.*, Hague, 1872, p. 240.
Hab. Sumatra.

### Genus Mochterus.

Loew, *Linn. Entom*, iv, 1849, p. 58; Asilus, pt.

**patruelis**, V. der Wulp, *Tijdschr. v. Ent.*, Hague 1872, p. 244.
Hab. Java.

### Genus Itamus.

Loew, *Linn. Entom*, iv, 1849, p. 84; Asilus, pt.

**dipygus**, Schiner, *Novar. Reise*, 1868, p. 188.
Hab. Nicobar Islands.

**latro**, Schiner, id., ibid., p. 189. Asilus id., Doleschall., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 394.
Hab. Java.

**griseus**, V. der Wulp, *Tijdschr. v. Entom.*, 1872, p. 246; Asilus id., Wiedem., *Ausser. Europ. Zweifl. Ins.* i, p. 442, *Hamm*, 1828.
Hab. Java.

**longistylus**, id., ibid., p. 247; Asilus id. Wiedem., *loc. cit.*, p. 433.
Hab. Java.

**fraternus**, id., *Naturlijke Historie IX, Sumatra Reisen*, p. 25, Asilus id., Macq., *Dipt. Exot., Supplt.*, 1. p. 91, *Paris*, 1846.
Hab. Borneo, Sumatra, Tasmania.

### Genus Tolmerus.

Loew, *Linn. Entom.*, 1849, iv, p. 94; Asilus, pt.

**agilis**, Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, xvi, 1866, p. 717; Asilus id., Wiedem., *Ausser. Europ. Zweifl. Ins.*, i, p. 456, *Hamm*, 1828.
Hab. Java.

**nicobarensis**, Schiner, *Novar. Reise*, 1868, p. 192.
Hab. Nicobar Islands.

### Family LAPHRIDÆ.

J. Bigot, *adhuc. ined.*; Laphrina, Rondani, *Prodr.*, i, p. 32, 1856; Laphrina, Schiner, 1862.

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## Genus Atomosia.

Macq., *Dipt. Exot.*, i, 2nd Pt., p. 73, *Paris*, 1838; Laphria, pt. Cormansis, pt. Walker.

**purpurata**, Westwood, *Trans., Ent. Soc., London*, v, 1847-49, p. 233.
Hab. India.

**halictides**, (*Cormansis* id.) Walker, *Ins. Saunders. Dipt.*, ii, p. 154, *London*, 1856.
Hab. India.

## Genus Nusa.

Walker, *Ins. Saunders. Dipt.*, i, p. 105, *London*, 1856.

**æqualis**, id., ibid, p. 105; Andrenosoma id., Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, 1866, p. 709.
Hab. India.

**formio**, id., ibid., p. 106; Andrenosoma id., Schiner, *loc. cit.*
Hab. India.

## Genus Michotamia.

Macq., *Dipt. Exot*, i, 2nd Pt., p. 72, *Paris*, 1838.

**analis**, id., ibid., p. 72.
Hab. Bengal, Java.

**annulata**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 239.
Hab. Burma.

## Genus Laxenecera.

Macq., *Dipt. Exot.*, i, 2nd Pt., p. 77, *Paris*, 1838; Laphria, pt. Dyseris, pt. Loew; Acurana pt. Walker, *Ins. Saunders. Dipt.*, ii, 1856, p. 107.

**albibarbis**, id., ibid., p. 78; id. Acurana sexfasciata, Walker, *Ins. Saunders, Dipt.*, ii, p. 107; See Walker, *List. Dipt. Ins. Brit. Mus.*, vii, *Supplt.*, iii, 1855, p. 572.
Hab. Bengal.

**flavibarbis**, id., ibid., p. 77; Sensu Walker, *List. Dipt. Ins. Brit. Mus., London* vii, *Supplt.*, iii, 1855, p. 572; Laphria hirticornis ? Guerin, *Icon. Règne. Anim. Ins.*, pl. 94.
Hab. India.

## Genus Hyperechia.

Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, 1866, p. 673; Laphria pt.

**xylocopiformis**, Walker, *List Dipt. Ins. Brit. Mus.*, ii, p. 385, *London*, 1849.
Hab. Madras.

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### Genus Dasyllis.

Loew, *Bemerk. z. Fam. d. Asilid.*, 1851, p. 20; Laphria. pt.

**gigas**, Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, 1866, p. 706; Laphria id., Macq., *Dipt. Ex.* i, 2nd Pt., p. 65, *Paris*, 1838.
Hab. India.

### Genus Andrenosoma.

Rondani, *Prodr.*, i, p. 160, 1856; Laphria, pt.

**crassipes**, Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, 1866, p. 709; Laphria id., Fabr., *Syst. Antl.*, p. 152.
Hab. Sumatra.

**fusifera**, id., ibid; Laphria id., Walker, *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 12.
Hab. Singapore.

### Genus Acurana.

Walker, *Ins. Saunders.* i, 1856, p. 107; Laphria, pt.

**sexfasciata**, id., ibid., p. 107.
Hab. India.

### Genus Chœrades.

Walker, *Ins. Saunders.* i, 1856, p. 109; Laphria, pt.

**aurigena**, id., ibid., p. 109.
Hab. Java, Sumatra.

### Genus Pogonosoma.

Rondani, *Prodr.*, i, 1856, p. 160; Laphria, pt.

**stigmatica**, V. d. Wulp, *Tijdschr. v. Entom.*, Hague, 1872, p. 157.
Hab. Sumatra.

**beccarii**, Rondani, *Ann. Mus. Civ. Genova*, i 1875, p. 449.
Hab. Sarawak.

### Genus Lampria.

Macq., *Dipt. Exot.*, i, 2nd Pt., *Paris*, 1838, p. 60; Laphria, pt.

**auribarbis**, Macq., id., ibid., *Suites du 2nd Supplt.*, *Paris*, 1847, p. 22.
Hab. Java.

### Genus Maira.

Schiner, *Novar. Reise*, 1868, p. 173; Laphria, Dasyllis, Lampria, pt.

**spectabilis**, Sensu Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, xvi, 1866, p. 708; Laphria, id., (*alias* splendida), Guerin, *Voyage Coquille*, ii, p. 292; Laphria kollari



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Doleschall *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 396; Laphriæ, Socia, Consobrina, Comes, Replens, Walker, *Journl. Proceed. Linn. Soc., London*, 1859, pp. 84, 85, et 1861, p. 234; *Sensu.* Osten.-Sacken., Laphria congrua, Walker, *loc. cit.*, 1861, p. 277.
Hab. Amboina, etc.

**elegans**, Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien*, 1866, p. 708; Laphria id., Walker, *List. Dipt. Ins. Brit. Museum, London*, vii, 3rd *Supplt.*, 1855, p. 551.
Hab. India.

**producta**, id., ibid., p. 708; Laphria id., Walker, *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 114.
Hab. Borneo.

**scapularis**, id., ibid.; Laphria id., Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 1st Part, *Hamm*, 1828, p. 516.
Hab. Java.

**ænea**, Sensu V. d. Wulp, *Tijdschr. v. Entom.*, 1872, Hague, p. 202; Laphria id., Fabr., *Syst. Antl.*, p. 161; Lampria id. Macq., *Dipt. Exot. Suites du 2nd Supplt. Paris*, 1847, p. 21; Laphria cyanea, Macq., *S. à Buff. Dipt.*, i, p. 286; Laphria colorata, Boisduval, *Voy., de l'Astrolobe.*
Hab. Java, New Guinea.

**nycthemera**, V. d. Wulp, *Tijd. v. Entom.*, Hague, 1872, p. 206.
Hab. Java.

**tuberculata**, id., ibid., p. 211.
Hab. Java.

**hispidella**, id., ibid., p. 213.
Hab. Java.

**nigrithorax**, id., ibid., p. 210.
Hab. Sumatra.

**paria**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 230.
Hab. India.

**cambodgiensis**, id., ibid., p. 230.
Hab. Cambodia.

## Genus Laphria.

Fabr., *Syst. Antl.*; Asilus, pt. Linn. (*et auctor.*).

**reinwardti**, Wiedem., *Ausser. Europ. Zweiflug. Ins.* 1st Part, p. 503, *Hamm*, 1828; Sensu Schiner, *Verhandl. K. K. z. b. Gesellsch, Wien*, 1866, p. 707, Laphria fervens, Walker, *List Dipt. Ins. Brit. Mus., London*, vii, 3rd *Supplt.*, p. 554, 1855.
Hab. Java.

**alternans**, id., ibid., p. 511; Sensu Walker *List Dipt. Ins. Brit. Mus., London*, vii, 3rd *Supplt.*, 1855, p. 555.
Hab. Java.

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**vulcanus**, id., ibid., p. 514.
Hab. Java, N. Ceram.

**leucoprocta**, id., ibid., p. 517.
Hab. Java.

**javana**, Macquart, *S. à Buff. Dipt.*, i, p. 282, *Paris*, 1834.
Hab. Java.

**senomera**, id., *Dipt. Exot.*, i, 2nd Part, p. 65, *Paris*, 1838.
Hab. Bengal.

**latere-punctata**, id., ibid., p. 66.
Hab. China.

**luteipennis**, id., ibid., *Suites du 2nd Supplt.*, p. 23, 1847.
Hab. Java.

**flavifacies**, id., ibid , *4th Supplt.*, p. 72, 1850.
Hab. Java.

**bipartita**, id., ibid., *5th Supplt.*, p. 52.
Hab. Java.

**semifulva**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 223.
Hab. India.

**melania**, id., ibid., p. 224.
Hab. Islands of the Indian Archipelago.

**claripennis**, id., ibid., p. 224.
Hab. Ceylon.

**sobria**, Walker, *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 12.
Hab. Singapore.

**basigutta**, id., ibid., p. 11.
Hab. Singapore.

**radicalis**, id., ibid., p. 11.
Hab. Singapore.

**basifera**, id., ibid., p. 11.
Hab. Singapore.

**orcus**, id., ibid., p. 10.
Hab. Singapore.

**notabilis**, id., ibid., p. 10.
Hab. Malacca.

**inaurea**, id., ibid., p. 11.
Hab. Singapore.

**plana**, id., ibid, p. 12.
Hab. Singapore.

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**imbellis**, id., ibid., p. 12.
Hab. Singapore.

**unifascia**, id., ibid., i 1857, p. 113.
Hab. Borneo.

**comptissima**, id., ibid., p. 113.
Hab. Borneo.

**rudis**, id., ibid., p. 114.
Hab. Borneo.

**lepida**, id., ibid., p. 114.
Hab. Borneo.

**completa**, id., ibid., p. 114.
Hab. Borneo.

**incivilis**, id., ibid., p. 115.
Hab. Borneo.

**partita**, id., ibid., p. 115.
Hab. Borneo.

**interrupta**, id., ibid., p. 115.
Hab. Borneo.

**cingulifera**, id., ibid., p. 115.
Hab. Borneo.

**detecta**, id., ibid., p. 116.
Hab. Borneo.

**constricta**, id., *List Dipt. Ins. Brit. Mus., London*, vii, *3rd Supplt.*, 1855, p. 555.
Hab. Sumatra.

**shalumus**, id., *List Dipt. Ins. Brit. Mus., London*, ii, 1849, p. 371.
Hab. Hong-Kong.

**abscissa**, id., *Trans. Entom. Soc., London*, 1858, p. 282.
Hab. Burma.

**horrida**, id., *List Dipt. Ins. Brit. Mus., London*, vii, *3rd Supplt.*, 1855, p. 551.
Hab. Sumatra.

**dira**, id., ibid., p. 551.
Hab. Sumatra.

**chrysotelus**, id., ibid., p. 552.
Hab. India.

**elva**, id., *List. Dipt. Ins. Brit. Mus., London*, ii, 1849, p. 445.
Hab. Bengal.

**triangularis**, id., ibid., vii, *3rd Supplt.*, 1855, p. 553.
Hab. Sumatra.

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**fervens**, id., ibid., p. 554.
Hab. Sumatra.

**sæva**, id., ibid., p. 554.
Hab. Sumatra.

**blumei**, V. d. Wulp, *Tijdschr. v. Entom.*, Hague, 1872, p. 170.
Hab. Java.

**ignobilis**, id., ibid., p. 173.
Hab. Java.

**mulleri**, id., ibid., p. 174.
Hab. Borneo, Java.

**gravipes**, id., ibid., p. 175.
Hab. Java.

**solita**, id., ibid., p. 178.
Hab. Java.

**histrionica**, id., ibid., p. 179.
Hab. Java.

**aureola**, id., ibid., p. 180.
Hab. Java.

**futilis**, id., ibid., p. 183.
Hab. Borneo, Sumatra.

**signatipes**, id., ibid., p. 191.
Hab. Sumatra.

**diversa**, id., Sumatra Expedi, V. d. Wulp, p. 22.
Hab. Silago.

**barbicrura**, Rondani, *Ann. Mus. Civ. Genova*, 1875, p. 447.
Hab. Sarawak.

**fulvicrura**, id., ibid., p. 448.
Hab. Sarawak.

**seticrura**, id., ibid., p. 448.
Hab. Sarawak.

**taphius**, Walker, *List. Dipt. Ins. Brit. Mus.*, *London*, 1848, p. 380.
Hab. Ceram, Philippine Is.

## Family THEREVIDÆ.

J. Bigot, *adhuc ined.* 1891; Xylotomæ, Meig., *Syst. Beschr.*, ii, 1820; Xylotomes, Macq., *S. à Buff., Dipt.* i, p. 416, *Paris*, 1834, Walker, Schiner; Anthracini, pt. Fallen; Therevinæ; Therevina, Rondani, *Prodr.*, i, 1856, pp. 31 et 155; Bombylidæ, pt. (*olim*). J. Bigot.

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## Genus THEREVA.

Fallen, 1820, *Rhisom.*; Thereva, Latr., *Precis Caract. Ins.* 1796; Psilocephala pt. Zetterst., *Dipt. Scand.*, i, 1842; Dialineura pt. Rond., *Prodr.*, i, 1856, p. 155; Bibio, pt. Panzer, Fallen; Nemotelus, pt. Degeer.

**nigella**, Wiedemann, *Ausser. Europ. Zweiflug. Ins.*, i, p. 232, *Hamm*, 1828.
Hab. Tranquebar, Madras Pr.

**albina**, id., *Zool. Magas.*, iii, p. 3.
Hab. Java.

**bigoti**, (=*Psilocephala indica* Bigot, name already occupied by Walker's species) J. Bigot, *Ann. Soc. Ent. France*, 1889, p. 326.
Hab. India.

**sequa**, Walker, *Ins. Saunders Dipt.*, i, p. 157, *London*, 1856.
Hab. India.

**sequens**, id., ibid., p. 158.
Hab. India.

**persequa**, id., ibid., p. 158.
Hab. India.

**nivaria**, id., ibid., p. 159.
Hab. India.

**indica**, id., ibid., p. 159.
Hab. India.

**cylindrica**, id., *List Dipt. Ins. Brit. Mus., London*, i, 1848, p. 224.
Hab. India.

**lateralis**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, i, p. 231, *Hamm*, 1828.
Hab. Ternate, Manilla.

**præcedens**, Walker, *Journ. Proceed. Linn. Soc., London*, i 1857, p. 118.
Hab. Borneo.

## Family EMPIDÆ (Hybotidæ).

Empidi, J. Bigot, *Ann. Soc. Ent. France*, 1889, p. 111 et 114; Hybotidæ, Hemerodromydæ, Tachydromydæ, id., *loc. cit.*; Empides, Latr., *Nouv. Dict. Hist. Nat.*, 1804; Empidi, Fallen, *Spec. Ent.*, 1810; Empidæ, id., *Disp. Dipt.*, 1817; id., Loew, Meigen; Empidæ, Leach, *Sam. Comp.*, 1819; Meigen, *Syst. Beschr.*, 1820; Hybotinæ, pt. Tachydromydae et Tachydromynæ, Latr. Zetterst. Macq., Wiedem.; Tachydromia, pt. Macq., *S. à Buff. Dipt.*; Empides, Hybotides, J. Bigot (*olim*); Empidii, Rondani, *Prodr.*, i, 1856; Empidæ, Empidina, Tachydromynæ, Phillodromyna, Hybotidina, (*olim*). Empidinæ, Walker, *List Dipt. Ins. Brit. Mus., London*, iii, p. 485, 490, 1849; Meig., *Syst. Beschr.*, 1820; Asilus Scopoli. pt. Empinæ, Hybotinæ, Schiner, 1862.

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### Genus Hybos.

Meigen., pt. *Illig. Magas.*, ii, 1803, p. 269; Musca, pt. Linn.; Empis, Dasypogon, Asilus, pt. Fabr.; Acromyia, Bonelli, *Manuscr., Encyclop.*, xi, 1819; Hybotidina, Rond., pt. *Prodr.*, i, 1856, p. 152.

**sagatinus**, J. Bigot, *Ann. Soc. Ent. France*, 1889, p. 127.
Hab. India.

**brachialis**, Rondani, *Ann. Mus. Civ. Genova*, 1875, p. 446.
Hab. Borneo.

### Genus Pterospylus.

Rondani, *Prodr.*, i, 1856, p. 152; Harpamerus, J. Bigot, *Rev. et Mag. Zool., Guerin*, 1859, p. 306; Epiceia, pt. Walker, *Journ. Proceed. Linn. Soc., London*, 1861, p. 149.

**bicolor**, J. Bigot, *Ann. Soc. Ent. France*, 1889, p. 127.
Hab. India.

### Genus Hilara.

Meigen., *Syst. Beschr.*, 3rd Pt., *Hamm*, 1822; Bibio, pt. Panzer; Tachydromyia, pt. Fabr.; Empis, pt. Fabr. Fallen.

**bares**, Walker, *List. Dipt. Ins. Brit. Mus.*, iii, p. 491, *London*, 1849.
Hab. India.

## Family DOLICHOPODÆ.

Dolichopodi, J. Bigot, *adhuc. ined.* 1891; Dolichopodes, Latr., *Gen. Crus. et Ins.*, iv, 1809; Dolichopidæ, Leach, *Sam. Comp.*, 1819; Dolichopodes, Macq., *S. à Buff. Dipt., Paris*, i, 1834, p. 434; Dolichopidæ, Rondani, *Prodr.*, i, p. 29, 1856; Dolichopinæ, (*olim*), Rond., *loc cit.*; Dolichopinæ, Rondani, *Prodr.*, p. 140, et Raphina, p. 145; Dolichopodii, (*olim*), J Bigot; Dolichopidæ, Schiner; Dolichopodes, Walker, *List. Dipt. Ins. Brit. Mus., London*, iii, 1849, p. 641.

### Genus Spathipsilopus.

J. Bigot, *Ann. Soc. Ent. France*, 1890, p. 268; Poilopus, Psilopodius, Rondani, pt.

**globifer**, J. Bigot, *loc. cit.*, p. 268; Psilopus, id., Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 221.
Hab. China.

### Genus Psilopodius.

Rondani, *Prodr.*, iv, Pt. 3, 1861, p. 11; Psilopodius, J. Bigot, *Ann. S. Ent. France*, Psilopus, Meig., *Syst. Beschr.*, iv, p. 35, *Hamm*, 1824; Leptopus, pt. Fallen, 1823; Sciapus, pt. Zeller, 1842; Agonosoma, (*alias* Chrysosoma) pt. Guérin, *Voy. de la Coquille*, 1830, p. 293.

**æneus**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 214.
Hab. Java.

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vittatus, id., ibid., p. 217.
Hab. Java.

crinicornis, Wiedem., *Auss. Europ.*, p. 222.
Hab. Java.

nitens, id., ibid., p. 226; Dolichopus id., Fabr., *Syst. Antl.*
Hab. India.

flavicornis, id., ibid., p. 227.
Hab. Sumatra.

apicalis, id., ibid., p. 227.
Hab. Sumatra.

leucopogon, Wiedem., *Anal. Entom.*, p. 40.
Hab. India.

pusillus, (*nomen bislectum*), Macq., *Dipt. Exot*, ii, 2nd Pt. *Paris*, 1842, p. 117.
Hab. India.

conicornis, id., ibid., *Supplt.*, 1846, p. 120.
Hab. Pondicherry, Sydney.

elegans, Walker, *Ins. Saunders, Dipt.*, i, *London*, 1856, p. 210.
Hab. India.

cœlestis, id., *List Dipt. Ins. Brit. Mus., London*, 1849, iii, p. 642.
Hab. India.

cupido, id., ibid., p. 643.
Hab. India.

setipes, Bigot, *Ann. Soc. Ent. France*, 1890, p. 284.
Hab. Indian Archipelago.

armillatus, id., ibid., p. 285.
Hab. Ceylon.

appendiculatus, id., ibid., p. 286.
Hab. Burmah.

fuscopennatus, id., ibid., p. 287.
Hab. Borneo.

clarus, Walker, *Journ. Proc. Linn. Soc. London*, i, 1857, p. 15.
Hab. Mt. Ophir.

robustus, id., ibid., p. 16.
Hab. Singapore.

subnotatus, id., ibid.
Hab. Mt. Ophir.

posticus, id., ibid.
Hab. Malacca.

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**tenebrosus**, id., ibid.
Hab. Singapore, Borneo.

**allectans**, id., ibid., p. 119, 1857.
Hab. Borneo.

**alliciens**, id., ibid.
Hab. Borneo.

**illiciens**, id., ibid., p. 120.
Hab. Borneo.

**delectans**, id., ibid.
Hab. Borneo.

**proliciens**, id., ibid.
Hab. Borneo.

**prolectans**, id., ibid.
Hab. Borneo.

**collucens**, id., ibid.
Hab. Borneo.

**derelictus**, id., ibid., p. 121.
Hab. Borneo.

**villipes**, Rondani, *Ann. Mus. Civ. Genova d. Stor. Nat.*, 1875, p. 445.
Hab. Sarawak.

**patellatus**, V. d. Wulp, *Sumatra Expedition*, p. 27.
Hab. Sumatra.

**obscuratus**, id., *Tijdschr. v. Entom.*, deel xxvii, p. 226.
Hab. Padang, Sumatra.

**filatus**, id., ibid., p. 227.
Hab. Java.

## Genus Rhaphium.

Meig., *Illig. Magas.*, ii, 1803, p. 272; Hydrochus, Fallen, 1823; Porphyrops, pt. Meigen; Xiphandrium, pt. Loew, *Neu. Beitr. Dipt.*, 1857.

**dilatatum**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd pt., *Hamm*, 1830, p. 11.
Hab. China.

## Genus Chrysotus.

Meig., *Syst. Beschr.*, iv, p. 40, 1824; Dolichopus, pt.

**rostratus**, J. Bigot, *Ann. Soc. Ent. France*, 1890, p. 295.
Hab. Ceylon.

**chinensis**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, p. 212, *Hamm*, 1830.
Hab. China.



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## Genus Mesorhaga.

Schiner, *Novar. Reise*, 1868, p. 217.

**torquata**, J. Bigot, *Ann. Soc. Ent. France*, 1890, p. 294.
Hab. Ceylon.

## Genus Dolichopus.

Latr., *Precis Caract. Gener.*, 1796; Nemotelus, pt. Panzer; Satyra, pt. Meig.

**fuscipennis**, Wiedem., *Analect. Entomol.*, p. 40.
Hab. India.

**zicsac**, id., ibid., p. 40.
Hab. India.

**electus**, Walker, *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 121.
Hab. Borneo.

**alligatus**, id., ibid., p. 121.
Hab. Borneo.

**collectus**, id., ibid., p. 121.
Hab. Borneo.

## Genus Argyra.

Macq., *S. à Buff. Dipt.*, i, *Paris*, 1834, p. 456; Schiner, Rondani, Zetterst., id.; Porphyrops, Meig. pt.

**spinipes**, Doleschall, *Naturk. Tijdschr. Nederl. Indie, Batavia*, 1856, p. 410.
Hab. Java.

## Genus Diaphorus.

Meig., *Syst. Beschr.*, iv, 1824, p. 32; Dolichopus, Fallen; Nematoproctus? Loew, *Neu. Beitr.*, 1857, p. 40.

**mandarinus**, Wiedem., *Ausser. Europ. Zweifl. Ins.*, ii pt., *Hamm*, 1830, p. 212.
Hab. China.

**delegatus**, Walker, *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 122.
Hab. Borneo.

**æneus**, Doleschall, *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, new series, 1856, p. 409.
Hab. Java.

## Genus Pedes.

Loew, *V. Neu. Beitr.*, 1857, p. 29.

**nicobarensis**, Schiner, *Novar. Reise*, 1868, p. 221.
Hab. Nicobar Islands.

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## Family BOMBYLIDÆ.

J. Bigot, *adhuc. ined.*, 1891; Bombyliarii, Latr., *Gen. Crust. et Ins.*, iv, p. 313, 1809; Bombylarii, Fallen, *Spec. Ent.*, 1810; Bombyliden, Leach, *Edinb. Encyclop.*, 1815; Bombylidae, Leach, *Sam. Comp.*, 1819; Bombyliers, Macq., *S. à Buff. Dipt.*, i, 1834; Bombylidae et Bombylina, Rondani, *Prodr.*, i, 1856, pp. 14, 33, 162; Bombylidæ, Schiner, 1862; Anthracii, pt. Latr., *Gen. Crust. et Ins.*, iv, p. 309, 1809; Anthracini, pt. Fallen, *Sp. Ent.*, 1810; Anthracides, pt. Leach, *Edinb. Encyclop.*, 1815; Anthracidae, id., *Sam. Comp.*, 1819; Anthraciens, pt. Macq., *S. à Buff. Dipt.*, i, 1834; Bombyliarii, Walker, *List. Dipt. Ins. Brit. Museum*, 1849.

### Genus EXOPROSOPA.

Macq. *Dipt. Exot.*, ii, 1st Pt., *Paris*, 1840, p. 35; Anthrax, pt. Hyperalonia, p. 58, Heteralonia, pt., p. 51, Argyrospila, pt., Rondani, *Archiv. p. l. Zool. Modena*, 1860, p. 58, *Sic. Nat. p. l.* Zoolog., p. 58, *Modena*, 1860, Trinaria, pt. Mulsant, 1852; Lithorhychus, pt. Macq., *Dipt. Exot.*, ii, 1st Pt., p. 78, *Paris*, 1840.

**pennipes**, Macq., *Dipt. Exot.* ii, 1st Pt., *Paris*, 1840, p. 47; Anthrax id, Wiedem., *Dipt. Exot.*, i, p. 129.
Hab. Java.

**sphinx**, id., ibid., p. 37; Bibio id., Fabr., *Mant. Ins.*, ii, p. 329.
Hab. India.

**bengalensis**, id., ibid., p. 49.
Hab. Bengal.

**javana**, id., ibid., p. 49.
Hab. Java.

**binotata**, id., ibid., *5th Suppl.*, 1855, p. 69.
Hab. India.

**flavofasciata**, id., ibid., p. 70.
Hab. China.

**chrysolampis**, Jaennicke, *Neu. Exot. Dipt., Frankfurt*, 1867, p. 36.
Hab. Java.

**albicincta**, Macq., *Dipt. Exot.*, ii, 1st Pt., *Paris*, 1840, p. 38.
Hab. Shanghai.

**brahma**, Schiner, *Novar. Reise*, 1868, p. 118.
Hab. Ceylon.

**aurantiaca**, Guèrin, *Iconogr.*, *Paris*, 1829-38, p. 39.
Hab. Bengal.

**doryca**, Sensu Ost.-Sacken, *Ann. Mus. Civ. Genova*, 1880, p. 433; Ventrimacula, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 399; Anthrax id., Boiduval, *Faun. d. l'Oceanie. Voy. de l' Astrolabe.*, ii, p. 665; Pelops, Walker, *Journl. Proceed. Linn. Soc., London*, iii, p. 90; Jaamicke, *Neu. Exot. Dipt.*, p. 37.
Hab. Borneo, Amboina, Ternate, N. Guinea, Aru, Moluccas, Gilolo.

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## Genus Hyperalonia.

Rondani, *Archiv. p. l. Zool. Modena*, 1863, p. 57; Exoprosopa, pt.

**audouinii**, Sensu Rondani, id., p. 57; Exoprosopa id., Macq., *Dipt. Exot.*, ii, 1st Part., 1840, p. 36.
Hab. India.

**fuscanipennis**, Sensu id., ibid., p. 57; Exoprosopa id., Macq., *Dipt. Exot., Suites du 2nd Supplt.*, 1847, p. 33.
Hab. Java.

**tantalus**, Sensu id, ibid., p. 453; Anthrax id., Fabr., *Ent. Syst.*, iv, p. 260.
Hab. Java.

**cenomœus**, id., ibid., p. 453.
Hab. Borneo.

## Genus Argyromœba.

Schiner, *Wien Entom. Monatschr.*, iv, 1860, p. 51; Anthrax, pt.

**semiscita**, Sensu Ost. Sacken, *Ann. Mus. Civ. Genova*, 1880, p. 432; Anthrax id., Walker, *Journ. Proceed. Linn. Soc., London*, 1857, p. 118.
Hab. Borneo.

**distigma**, Sensu Schiner, *Novar. Reise*, 1868, p. 122; Anthrax id., Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 1st Part, *Hamm*, 1828, p. 309; *Sensu* V. d. Wulp, *Tijdschr. Ent.*, deel, xxiii, Anthrax argyropyga, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 401.
Hab. Amboina, Java.

**melania**, V. d. Wulp, *Notes f. Leyden Museum*, Not. vii, 1885, p. 84.
Hab. Java.

## Genus Anthrax.

Scopoli, *Entom. Carniol.*, 1763, p. 358; Nemotelus, pt. Degeer; Bibio, Rossi. pt.

**sphinx**, Fabr., *Ent. Syst.*, iv, p. 261.
Hab. India.

**lar**, id., ibid., p. 257.
Hab. Bengal.

**bipunctata**, Fabr., *Syst. Antl.*, p. 118.
Hab. Tranquebar Madras Pr.

**dia**, Wiedem., *Anal. Entom.*, p. 23.
Hab. Tranquebar Madras Pr.

**troglodyta**, Sensu V. d. Wulp, *Notes f. Leyden Mus.*, 1885, p. 83; Anthrax hyalina, Wiedem., *Dipt. Exot.*, i, p. 141; Anthrax lucens, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 180.
Hab. India, Java.

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**fulvula**, Wiedem., *Dipt. Exot.*, i, p. 148.
Hab. Java.

**absalon**, id., *Ausser. Europ. Zweiflug. Ins.*, 1st Part, *Hamm*, 1828, p. 817.
Hab. India.

**satyrus**, (*Bibio*) Fabr., *Mantissa Ins.*, ii, p. 329.
Hab. China.

**duvaucelii**, Macquart, *Dipt. Exot.*, ii, 1*st part*, p. 63.
Hab. Bengal.

**appendiculata**, id., ibid., 5*th Supplt.*, 1855, p. 74.
Hab. China.

**purpuraria**, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 169.
Hab. Java.

**semilucida**, id., ibid., p. 170.
Hab. India.

**albida**, id., ibid., p. 171.
Hab. India.

**auriplena**, id., ibid., p. 171.
Hab. India.

**insulata**, id., ibid, p. 172.
Hab. India.

**carbonaria**, id., ibid., p. 173.
Hab. India.

**manifesta**, id., ibid., p. 178.
Hab. India.

**clara**, id., ibid., p. 179.
Hab. India.

**lucida**, id., ibid., p. 179.
Hab. India.

**limpida**, id., ibid., p. 179.
Hab. India.

**aperta**, id., ibid., p. 180.
Hab. India.

**albo-fulva**, id., ibid., p. 182.
Hab. India.

**instituta**, id., ibid., p. 183.
Hab. India.

**referens**, id., ibid., p. 189.
Hab. India.

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**dives**, id., *List Dipt. Ins. Brit. Mus., London*, 1849, ii, p. 240.
Hab. Sylhet.

**bimacula**, id., ibid., p. 254.
Hab. China.

**alexon**, id., ibid., p. 246.
Hab. India.

**collaris**, id., ibid., p. 247.
Hab. Madras.

**basifascia**, id., ibid., p. 248.
Hab. Bengal.

**combinata**, id., *Trans. Ent. Soc., London*, (2), iv, 1857, p. 143.
Hab. China.

**degenera**, id., *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 15.
Hab. Singapore.

**satellitia**, id., ibid., i, 1857, p. 119.
Hab. Borneo, N. Ceram.

**carbo**, Rondani, *Ann. Mus. Civ. di Stor. Nat. Genova*, 1875, p. 453.
Hab. Sarawak.

**ruficollis**, Saunders, *Trans. Ent. Soc., London*, iii, 1841 p. 59.
Hab. India.

## Genus Bombylius.

Linn., *Faun. Suec*, 1761.

**maculatus**, Fabr., *Syst. Antl.*, p. 803.
Hab. Tranquebar Madras Pr.

**orientalis**, Macq., *Dipt. Exot.*, ii, 1st Part, *Paris*, 1840, p. 90.
Hab. India.

**socius**, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 201.
Hab. India.

**ardens**, id., *List Dipt. Ins. Brit. Mus., London*, 1849, ii, p. 284.
Hab. India.

**tricolor**, Guèrin, *Iconogr., Paris*, 1829-30, p. 538.
Hab. India.

## Genus Comastes.

Ost.-Sack., *Western Dipt.*, 1877, p. 256; *Washington*; Bombylius, pt.

**pulchellus**, V. d. Wulp, (*G. Bombylius*), *Tijdschr. v. Entom.*, xxiii, p. 164.
Hab. Java.

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### Genus ANASTŒCHUS.

Ost.-Sack., *Western Dipt., Washington*, 1877, p. 252; Bombylius, pt.

**longirostris**, V. d. Wulp, *Notes f. Leyden Mus.*, 1885, p. 85.
Hab. Himalayas.

### Genus PHTHIRIA.

Meig., *Illig., Magaz.* ii, 1803, p. 268; Bombylius, pt. Mikan; Volucella, pt. Fabr.

**gracilis**, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 194.
Hab. India.

### Genus TOXOPHORA.

Meig, *Illig. Magaz.*, ii, 1803, p. 270; Bombylius, pt. Fabr.

**javana**, Wiedem., *Dipt. Exot.*, i, p. 179.
Hab. Java.

**silpa**, Walker, *List Dipt. Ins. Brit. Museum, London*, ii, 1849, p. 298.
Hab. China.

### Genus SYSTROPUS.

Wiedem., *Nov. Dipter. Genera*, 1820.

**ophioneus**, Westwood, *Trans. Ent. Soc., London*, 1876, p. 574.
Hab. India.

**polistoides**, id., ibid., p. 575.
Hab. Siam.

**tipuloides**, id., ibid., p. 576.
Hab. Sulu.

**eumenoides**, Westw. *Guerin. Mag. Zool.*, 1842, p. 4, pl. 90.
Hab. India.

## Family PIPUNCULIDÆ.

J. Bigot, *adhuc ined.*, 1891; Pipunculini, Zetterst., *Dipt. Scandin.*, i, 1842; Pipunculidae, Schiner, 1862; Pipunculidæ, Rondani, *Prodr.*, i, p. 13, 1856, et Pipunculina, ibid., p. 139; Megacephali, Walker, *List Dipt. Ins. Brit. Mus., London*, 1849, iii, p. 639.

### Genus PIPUNCULUS.

Latr., *Gen. Crust. Ins.*, iv, p. 232, 1809; Cephalops, Fallen; Microcera, Meig.; Cephalops (*olim*) Fallen.

**armatus**, Thomson, *Eugenies Resa, Stockholm*, 1858-68, p. 513.
Hab. China.

**abscissus**, id., ibid., p. 514.
Hab. China.

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## Family CONOPSIDI.

J. Bigot, *adhuc ined.*, 1891 ; Conopsariæ, Latr., *Gen. Crust. et Ins.*, iv, p. 333, 1809 ; Conopsarii, id., *Hist. Nat.*, 1804 ; Conopsides, Leach, *Edinb. Encyclop.*, 1815 ; Conopica, Nitzch, *Germar. Magaz. Entom.* 1818 ; Conopsariae, Meig., 1824 ; Conopidæ, Leach, *Steph. Catal.*, 1829, id., ibid., *Sam. Comp.*, 1819 ; Conopsariæ, Macq., *S. à Buff.*, ii, 1835 ; Conopsariæ, Walker, *List., Dipt. Ins. Brit. Mus., London*, 1849, p. 669, Conopidæ, Rondani, *Prodr.*, i, p. 11, 1856, et Conopina, ibid., p. 56, (*olim* Conopinæ) ; Conopsidii (*olim*), J. Bigot ; Conopidœ, Schin., 1862.

### Genus CONOPS.

Linn., *Faun. Suec*, 1761 ; Brachyglossum, Leopoldius, Conopsides, Conopœjus, Conopilla, Sphixosoma, Spariglossum, Physocephala, pt. Rondani ; Bombibia, Lioy, 1863.

erythrocephala, Fabr., *Syst. Antl.*, iv, p. 392.
Hab. India.

testacea, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 9.
Hab. Bengal.

gigas, id., ibid., p. 10.
Hab. Java.

pactyas, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 255.
Hab. Java.

javanica, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie., Batavia*, 1856, p. 409.
Hab. Djokjokarta.

calopus, J. Bigot, *Ann. Soc. Ent. France*, 1887, p. 33.
Hab. Pondicherry.

tenellus, J. Bigot, *Ann. S. Ent. France*, 1887, p. 35.
Hab. Ceylon.

nubeculosus, id., ibid., p. 36.
Hab. Ceylon.

annulosus, id. ibid., p. 36.
Hab. Islands of the Indian Archepelago.

## Family SYRPHIDI.

J. Bigot, *adhuc. ined.*, 1891 ; Syrphiæ, Latr., *Gen. Crust. et Ins.*, iv, p. 319, 1809 ; Syrphides, Leach, *Edimb. Encyclop.*, 1815 ; Syrphici, Fallen, Disp. *Dipter.*, 1817 ; Syrphidæ. Leach, *Sam. Comp.*, 1819 ; Syrphici, Meig., *Syst. Beschr* ; Syrphidæ, Macq., *S. à Buff. Dipt.*, i, p. 468, *Paris*, 1834 ; Syrphici, Walker, *List.* iii, p. 537, *London*, 1849 ; Syrphidæ, p. 11, et Syrphina, p. 46, Rondani, *Prodr.* i, 1856 ; Syrphidiæ, Wiedem. ; Syrphinæ, (*Olim*). Rondani ; Syrphidæ, Schiner, 1862 ; Syrphidii (*olim*), J. Bigot.

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## Genus Ceria.

Fabr., *Entom. System.*, iv, p. 277; Conops, pt. Schr.; Syrphus, pt. Panzer.; Sphiximorpha, pt., Rondani, *Prodr.*, i, 1856, p. 55; V. Loew. *N. Beitr.*, 1852; Saunders, *Trans.* 1845–47, p. 63, Monog.

**javana**, Wiedem., *Analect. Entom.*, p. 32.
Hab. Java.

**eumenioides**, Saunders, *Trans. Ent. Soc., London*, 1841–43, iii, p. 60.
Hab. Bengal.

## Genus Sphyximorpha.

Rondani, *Prodr.*, i, 1856, p. 55; Ceria pt. Fabr.

**anchorata**, J. Bigot, *Ann. Soc. Ent. France*, 1883, p. 318.
Hab. Sarawak.

## Genus Sphixea.

Rondani, *Prodr.*, i, 1856, p. 46; Milesia, pt.

**fulvipes**, J. Bigot, *Ann. Soc. Ent. France*, 1883, p. 340.
Hab. Java.

**fuscicosta**, id. ibid., 1875, p. 469.
Hab. Sarawak.

**flavifacies**, id. ibid., 1875, p. 471.
Hab. Sarawak.

## Genus Milesia.

Latr, *Gen. Crust. et Ins.*, iv, p. 329, 1809; Syrphus pt. Fabr.; Eristalis, pt. Fabr. Sphixea, pt. and, Calliprobola, pt. Rond., *Prodr.*, i, 1856, p. 47.

**reinwardtii**, Wiedem., *Anal. Entom.*, p. 33.
Hab. Java, Singapore.

**macularis**, id. ibid., p. 34.
Hab. Java, Singapore.

**gigas**, Macq., *Dipt. S. à Buff.*, i, *Paris*, 1834, p. 533.
Hab. Java.

**limbipennis**, id., *Dipt. Exot. Suit. du 2nd Supplt.*, 1847, p. 42.
Hab. Java.

**meyeri**, Jaennicke, *N. Exot. Dipt.*, *Frankfurt*, 1867, p. 95.
Hab. Java.

**vespoides**, Walker, *Journl. Proceed. Linn. Soc., London*, 1857, p. 18.
Hab. Singapore.



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## Genus Chrysotoxum.

Meig., *Illig. Magaz.*, ii, 1803, p. 275; Conops, pt., Scopoli; Mulio, pt., Fabr., Fallen; Syrphus, pt., Panzer; Milesia, pt., Fabr.

**baphyrus**, Walker, *List Dipt. Ins. Brit. Mus., London*, iii, 1849, p. 542.
Hab. Bengal.

**antiquum**, id., *Ins. Saunders. Dipt.*, i, 1856, *London*, p. 218.
Hab. India.

**indicum**, id., ibid., p. 218.
Hab. India.

## Genus Microdon.

Meig., *Illig. Magaz.*, ii, p. 275, 1803; Mulio, Stratiomys, pt. Panzer; Aphritis, Latr., *Gens. Crust. et Ins.*, iv, p. 329, 1809; id. Macq., *S. a Buff., Dipt.* i, *Paris*, 1834, p. 486.

**stilboides**, Walker, *List Dipt. Ins. Brit. Mus., London*, 1849, iii, p. 538.
Hab. India.

**sumatranus**, V. d. Wulp, *Sumatra Exped.*, p. 29.
Hab. Sumatra.

**apicalis**, id., ibid., p. 29.
Hab. Sumatra.

## Genus Ascia.

Meig., *Syst. Beschr.*, 3rd pt., *Hamm*, 1822, p. 186.

**brachystoma**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Part, *Hamm*, 1830, p. 90.
Hab. India.

## Genus Baccha.

Fabr., *Syst. Antl.*, 1805, p. 199; Meig., Fall., Latr., Wiedem., Walker. Macq., Rondani; Syrphus, pt. Fabr.; Baca vel Bacha, Schiner, 1862.

**sapphirina**, Wiedem., *Ausser. Europ. Zweifl. Ins.*, 2nd pt., *Hamm*, 1830, p. 98.
Hab. India.

**vittata**, ? (Wiedem) *nomen bislectum*, Macq., *Dipt. Exot.*, ii, 2nd Pt., 1842, p. 108.
Hab. Java.

**maculata**, Walker, *Ins. Saunders., Dipt.*, i, *London*, 1856, p. 223.
Hab. India.

**amphithoe**, id., *List Dipt. Ins. Brit. Mus., London*, iii, 1849, p. 549.
Hab. India.

**tripartita**, id., *Journl. Proceed. Linn. Soc., London*, vii, 1864, p. 212; v. Schiner, *Novar. Reise.*, p. 344.
Hab. Batchian; Nicobar Islands.

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**pedicellata**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1856, p. 411.
Hab. Java.

**gratiosa**, J. Bigot, *Ann. Soc. Ent. France*, 1883–84, p. 335.
Hab. Sarawak.

## Genus Lycastris.

Walker, *Trans. Ent. Soc., London*, 1857, p. 155.

**albipes**, id. ibid., p. 155.
Hab. India.

## Genus Tigridomyia.

J. Bigot, (*olim*, Tigridemyia vel. Tigridiamyia); J. Bigot, *Ann. Soc. Ent. France*, 1883, *Bullet. No.* 13, p. 348.

**pictipes**, id. *Ann. S. Ent. France*, p. 348, 1883–84.
Hab. Java.

## Genus Ischyrosyrphus.

J. Bigot, *Ann. Soc. Ent. France*, 1882, *Bullet. No.* 6, p. 68.

**sivæ**, id. ibid., p. 78.
Hab. India.

**tigerinus**, id., *Ann. Soc. Ent. France*, 1885, p. 249.
Hab. India.

## Genus Ancylosyrphus.

J. Bigot, *Ann. Soc. Ent. France*, 1882, *Bullet. No.* 6, p. 68.

**salviæ**, id. ibid., Syrphus id., Fabr., *Ent. Syst.* iv, p. 306, (1794); *Sensu* Wiedem, *Ausser. Europ. Zweifl. Ins.*, ii, p. 122; *Sensu* Osten-Sacken, *Ann. Mus. Civ. Genova*, 1880, p. 438; Syrphus ericetorum, Fabr., *Ent. Syst.*, iv, p. 287; Syrphus incisuralis? Macquart, *Dipt. Exot., 5th Supplt., Paris*, 1855, p. 94; Didea macquarti, Doleschall, *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 408.
Hab. Java, Amboina, Ternate, Celebes, New Guinea, etc.

## Genus Simosyrphus.

J. Bigot, *Ann. Soc. Ent. France*, 1882, *Bullet. No.* 6, p. 79.

**planifacies**, id. ibid., p. 79; Syrphus id. Macq., *Dipt. Exot., Suites du 2nd Supplt*, 1847, p. 43.
Hab. Java.

## Genus Eumerosyrphus.

J. Bigot, *Ann. Soc. Ent. France*, 1883, 349.

**indicus**, (*olim* indianus); id. ibid., p. 349.
Hab. India.

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## Genus Endoiasimyia.

J. Bigot, *Ann. Soc. Ent. France*, 1883, *Bullet. No.* 15, p. 549.

**indiana**, id. ibid., p. 549.
Hab. India.

## Genus Cartosyrphus.

J. Bigot, *Ann. Soc. Ent. France*, 1883–84, p. 230, 1st pt.

**pilipes**, id. ibid., p. 551, 1st pt.
Hab. India.

## Genus Priomerus.

Macqnart (et Serville), *Suit. à Buff. Dipt.*, i, *Paris*, 1834, p. 511.

**fasciatus**, id. ibid., p. 512.
Hab. India.

## Genus Sphegina.

Meigen, *Syst. Beschr.*, iii, *Hamm.*, 1822, p. 193; Milesia, pt., Fall.; Syrphus, pt., Panzer.

**macropoda**, J. Bigot., *Ann. Soc. Ent. France*, 1883–84, p. 331.
Hab. Burma.

## Genus Megaspis.

Macq., *Dipt. Exot.*, ii, 2nd part, *Paris*, 1842, p. 27; Eristalis pt. Phytomyia, Guerin, *Voy. Bellanger, Zool.*, p. 509; Syrphus, Fabr. pt.

**chrysopygus**, Sensu Macq., *Dipt. Exot.*, ii, 2nd Pt., 1842, p. 27; Eristalis id. Wied., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 152; Phytomyia, id. Guerin (*loc. cit.*).
Hab. India, Sylhet, Java, etc.

**crassus**, id. ibid., p. 28; *Sensu* Walker, *List. Dipt. Ins. Brit. Mus.*, *London*, 1849, iii, p. 631; Syrphus, id., Fabr., *Ent. Syst.*, iv, p. 281; Syrphus megacephalus, Fabr., *Ent. Syst.*, *Suppl.*, 561, 17.
Hab. Tranquebar.

**zonalis**, id. ibid., *5th Supplt.*, 1855, p. 86; Syrphus id. et, zonatus, Fabr., *Ent. Syst.*, iv, p. 294, *Sensu* V. d. Wulp, *Sumatra Exped.*, Eristalis, id., Fabr., *Syst. Antl.*, p. 242, et Wiedem, Sensu Ost.-Sacken, *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1880, p. 441; Eristalis flavofasciatus, Macq., *Dipt. Exot.*, *4th Supplt.*, 1850, p. 136.
Hab. China, Java, Sumatra, India.

**errans**, Sensu V. d. Wulp, *Tijdschr. v. Entom.*, 1879-80, p. 170; Eristalis id., Fabr., *Ent. Syst.*, iv, p. 294; Sensu Ost.-Sack., (*loc. cit.*), Erist. varipes, Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 46; Eristalis macquarti, Dolesch., *Naturk. Tijdschr. v. Nederland Indie*, *Batavia*, 1856, p. 410; Eristalis amphicrates, Walker, *List. Dipt. Ins Brit. Mus.*, *London*, iii, 1849, p. 623.
Hab. India, Java, China.

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## Genus Eristalis.

Latr., *Gen. Crust. et Ins.*, iv, p. 323, 1809; Conops, pt., Scopoli; Syrphus, pt., Fab., Zett.; Elophilus, pt., Latr; Axona, pt., Walker, *Journl. Proceed. Linn. Soc., London*, vii, 1864, p. 210; Eristalinus et Eristalomyia, pt., Rondani, *Prodr.*, ii, 1857, p. 40.

**cerealis**, Fabr., *Syst. Antl.*, p. 232.
Hab. China.

**proserpina**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd pt., *Hamm*, 1830, p. 157.
Hab. China.

**vestitus**, id. ibid., p. 159.
Hab. Java.

**vilis**, id. ibid., p. 164.
Hab. Java.

**quadrivittatus**, id. ibid., p. 168, et *Zool. Mag.*
Hab. Bengal?

**bengalensis**, id. ibid., et, *Zool. Mag.*, iii. p. 167.
Hab. Bengal.

**sinensis**, id., *Anal. Entom.*, p. 37.
Hab. China.

**cognatus**, id. ibid., p. 37.
Hab. Tranquebar Madras Pr.

**orientalis**, id. ibid., p. 38.
Hab. Java.

**niger**, id. ibid., p. 38.
Hab. Java, Bengal.

**arvorum**, Sensu Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 184; Syrphus id., Fabr., *Ent. Syst.*, iv, p. 286.
Hab. Bengal, Java, China.

**quadrilineatus**, Sensu Wiedem., id. ibid., p. 185; Syrphus, id. Fabr., *Ent. Syst.*, iv, p. 289.
Hab. Tranquebar Madras Pr., Bengal.

**obliquus**, id., *Anal. Entom.*, p. 38.
Hab. Bengal.

**quinquestriatus**, Sensu id., *Ausser. Europ. Zweifl. Ins.*, ii, *Hamm*, 1830, p. 187; Syrphus id., Fabr., *Ent. Syst.*, iv, p. 289.
Hab. India.

**lœtus**, id. ibid., p. 192.
Hab. China.

**sugens**, id. ibid., p. 193.
Hab. China.

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**javanus**, Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 32.
Hab. Java.

**dentipes**, id. ibid., p. 37.
Hab. Java.

**vinctorum**, Fabr., *Ent. Syst.*, *Supplt.*, p. 562, et Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 41.
Hab. Bengal ? South America ?

**argyrocephalus**, Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 45.
Hab. India.

**pallinervis**, id. ibid., p. 46.
Hab. Bengal.

**latus**, id. ibid., p. 35.
Hab. India.

**quadristriatus**, id. ibid., *Supplt.*, 1846, p. 127.
Hab. India.

**tomentosus**, id. ibid., *Suites du 2e 2nd Supplt.*, 1847, p. 39.
Hab. Java.

**violaceus**, id. ibid., p. 40.
Hab. Java.

**tarsalis**, id. ibid., *5th Supplt.*, p. 87.
Hab. China.

**exterus**, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 248.
Hab. India.

**multifarius**, id. ibid., p. 248.
Hab. India, Java.

**solitus**, id., *List Dipt. Ins. Brit. Mus.*, iii, *London*, 1849, p. 619.
Hab. Nepal.

**æsepus**, id. ibid., p. 625.
Hab. China.

**antidotus**, id. ibid., p. 626.
Hab. China.

**andræmon**, id. ibid., p. 627.
Hab. Sylhet.

**æsymnus**, id. ibid., p. 630.
Hab. India.

**chalcopygus**, Sensu Ost.-Sacken, *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1880, p. 440, Axona volucelloides, Walker, *Journ. Proceed. Linn. Soc., London*, vii, p. 212, and, Eristalis maxima, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 405.
Hab. Manilla, Amboina.

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**singularis**, Walker, *Journ. Proceed. Linn. Soc. London*, iii, 1857, p. 17.
Hab. Singapore.

**nitidus**, V. d. Wulp, *Compt. Rendus, Soc. Ent. d. Belgique*, 1884, p. 291.
Hab. Java.

**transpositus**, Walker., *Trans. Ent. Soc., London*, v, 1860, p. 289.
Hab. Burmah.

**curvipes**, Schiner, *Novara. Reise*, 1868, p. 363.
Hab. Ceylon.

**quinquelineatus**, Fabr., *Spec. Ins.*, ii, p. 425, *Sensu* Schiner, *Novar. Reise*, 1868, p. 364. E. quinquefasciatus, Loew, *Faun. Sudafrika*, i, p. 396, (324).
Hab. Ceylon, South Africa?

**ursinus**, Jaennicke, *N. Exot. Dipt., Frankfurt*, 1867, p. 93.
Hab. Java.

**ventralis**, Thomson, *Fregatt. Eugenie's Resa, Stockholm*, 1858–68, p. 489.
Hab. China.

**barbatus**, J. Bigot, *Ann. Soc. Ent. France*, x, 1880, p. 214.
Hab. India.

**ursinus**, (*nom. bislectum*), id. ibid., p. 215.
Hab. India.

**albibasis**, id. ibid., p. 215.
Hab. India.

## Genus Eristalomyia.

Rondani, *Prodr.*, ii, 1857, p. 40; Eristalis, pt.

**orientalis**, Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 421.
Hab. Borneo.

**paria**, J. Bigot, *Ann. Soc. Ent. France*, x 1880, p. 218.
Hab. India.

**picta**, id. ibid., p. 219.
Hab. India.

**fo**, id. ibid., p. 220.
Hab. Amoy.

## Genus Merodon.

Meig., *Illig. Magaz.*, ii, 1803, p. 274; Syrphus pt. Milesia, pt. Latr., Fabr.

**albifasciatus**, Macq., *Dipt. Exot.*, ii, 2nd Pt. *Paris*, 1842, p. 71.
Hab. India.

**varicolor**, Walker, *Journl. Proceed. Linn. Soc., London*, 1857, p. 122.
Hab. Sarawak.

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## Genus Tropidia.

Meig., *Syst. Beschr.*, iii, *Hamm*, 1822, p. 346; Eristalis, pt. Fallen.

**sinensis**, Macq., *Dipt. Exot.*, *5th Supplt.*, *Paris*, 1855, p. 91.
Hab. China.

## Genus Imatisma.

Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 68; Sensu J. Bigot, Zetterstedtia, Rondani.

**orientalis**, Macq., id. ibid., p. 69.
Hab. India.

## Genus Helophilus.

Meig., *Illig. Mag.*, ii, 1803, p. 274; Conops, pt. Scopoli; Syrphus, pt. Panzer, Eristalis, Fabr., Wied; Elophilus, Latr. Rhingiœ, pt. Fabr.

**bengalensis**, Sensu Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 63; Eristalis, id Wiedem., *Zool. Magaz.* iii, p. 16.
Hab. Bengal.

**notabilis**, id. ibid., p. 63.
Hab. Java, Sumatra?

**insignis**, Walker, *Journl. Proc. Linn. Soc., London*, 1857, p. 17.
Hab. Singapore.

**insignis**, (*nom. bislectum*), Doleschal, *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 409.
Hab. Java.

**pilipes**, id. ibid., p. 410.
Hab. Java, Amboina.

## Genus Senogaster.

Macq., *S. à Buff. Dipt.*, i, *Paris*, 1834, p. 519.

**lutescens**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1856, p. 410.
Hab. Java.

## Genus Eumerus.

Meig., *Syst. Beschr.*, iii, *Hamm*, 1822, p. 202; Syrphus, pt. Panzer; Eristalis, pt. Fabr.; Milesia, pt. Latr.

**macrocerus**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 113.
Hab. China.

**aurifrons**, id. ibid., p. 114.
Hab. India.

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**splendens**, id. ibid., p. 114.
Hab. India.

**albifrons**, Walker, *Ins. Saunders, Dipt.*, i, *London*, 1856, p. 224.
Hab. India.

**nicobarensis**, Schiner, *Novar. Reise.*, 1868, p. 368.
Hab. Nicobar Islands.

## Genus Syritta.

St. Farg. Servill, *Encyclop. Method.*, x, 1825, p. 808; Conops, pt. Scopoli; Syrphus, pt. Fallen; Milesia, pt. Fabr. Latr.; Xylota, pt. Meig. Westwood; Coprina, pt. Zetterst.

**rufifacies**, J. Bigot, *Ann. Soc. Ent. France*, 1883-84, p. 538.
Hab. Pondicherry.

**orientalis**, Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 76.
Hab. Pondicherry.

## Genus Xylota.

Meig., *Syst. Beschr.*, iii, *Hamm*, 1822, p. 211; Syrphus, pt. Panz.; Milesia, pt. Fall. Latr. Micramptoma, Westw.; Helophilus, pt. Meig. (*olim*), Eumeros, id. (*olim*); Microdon, Thereva, pt. Fabr.; Eristalis, pt. Fallen; Xyloteja, pt. Rondani, *Prodr.*

**calopus**, J. Bigot, *Ann. Soc. Ent. France*, 1883-84, p. 543.
Hab. Java.

**indica**, Wiedem., *Anal. Entom.*, p. 33; Synon., Eumerus, id. (*olim*).
Hab. India.

**æqualis**, Walker, *Ins. Saunders. Dipt., London*, i, 1856, p. 226.
Hab. India.

**æthusa**, id., *List. Dipt. Ins. Brit. Mus., London*, Pt. iii, 1849, p. 559.
Hab. India.

**conformis**, id., *Journl. Proceed. Linn. Soc., London*, 1857, p. 18.
Hab. Singapore.

**cuprina**, J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 247.
Hab. India.

**nigrosenescens**, Rondani, *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1875, p. 422.
Hab. Borneo.

## Genus Graptomyza.

Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd pt., *Hamm*, 1830, p. 206.

**ventralis**, Wiedem., ibid., p. 207.
Hab. Java.



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longirostris, id. ibid., p. 208.
Hab. Java.

interrupta, id. ibid., p 209.
Hab. Java.

brevirostris, id. ibid., p. 209.
Hab. Java, Nicobar Islands.

### Genus Baryterocera.

Walker, *Journl. Proceed. Linn. Soc., London*, 1857, p. 123; Graptomyza, pt.

inclusa, Walker, id. ibid., p. 123.
Hab. Borneo.

### Genus Citibœna.

Walker, *Journl. Proceed. Linn. Soc., London*, 1857, p. 124.

aurata, Walker, ibid., p. 124.
Hab. Borneo.

### Genus Volucella.

Geoffroy, *Hist. Ins. des Environs d. Paris*, ii, 1764; Conops, pt. Scopoli Syrphus, pt. Fabr., Fallen; Coenogaster, Dumeril, 1801; Ornidia, pt. St. Fargean.

peleterii, Macq., *S. à Buff. Dipt.*, i, *Paris*, 1834, p. 495.
Hab. Java.

opalina, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 203.
Hab. Bengal.

trifasciata, id. ibid., p. 196.
Hab. Java.

nubeculosa, J. Bigot, *Ann. Soc. Ent. France*, 1875, p. 474.
Hab. China.

aurata, Macq., *S. à Buff.*, i, *Paris*, 1834, p. 494.
Hab. Java.

obesa, (G. Ornidia, St. Farg.), Fabr., *Syst. Ent.*, p. 763.
Hab. Inter Tropica ferè undique.

### Genus Temnocera.

St. Fargeau, Serville, *Encyclop. Method.*, x, 1805, p. 787; Volucella, pt. Wiedem.

violacea, Macq, *S. à Buff. Dipt.*, i, *Paris*, 1834, p. 495; Sensu Macq., Valucella mutata, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 198.
Hab. China.

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## Genus Lasiophthicus.

Rondani, *Prodr.*, i, 1856, p. 51; Syrphus, pt.; Catabomba! Ost.-Sacken, *Western Dipt.*, Washington, 1877, p. 325.

**annamites**, J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 250.
Hab. Cochin China.

## Genus Paragus.

Latr., *Gen. Crust. et Ins.*, iv, p. 326, 1809; Mulio, pt. Fabr; Syrphus, pt. Panzer; Pipiza, pt. Fallen.

**serratus**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, i, *Hamm*, 1830, p. 88; Sensu Wied. Mulio, id. Fabr., *Syst. Antl.*, p. 186.
Hab. Tranquebar, Ceylon.

**politus**, id. ibid., p. 89.
Hab. China.

**crenulatus**, Thomson, *Fregatt. Eugenies Resa, Stockholm*, 1858-68, p. 503.
Hab. China.

## Genus Syrphus.

Fabr., *Syst. Ent.*, 1775; Musca, pt. Linn.; Scœva, Fabr., Fall., Panzer, Zetterst.; Leucozona, pt. Schiner, *Wien. Entom. Monatschr.*, vi, 1860. p. 214; Eriozona, pt. ibid., p. 214; Spatigaster, or Spazigaster, pt, Rondani, *Rev. Entomol.*, 1843; Pyrophœna, pt. Schiner, *Wien. Entom. Monutschr.*, 1860, p. 213; Platycheirus, pt. St. Farg. Serville, *Encycl. Method.*, x, 1825, p. 513; Melanostoma, pt. Schiner, *Wien. Entom. Monaschr.*, iv, 1860, p. 213; Ischyrosyrphus, Ancylosyrphus, Simosyrphus pt. J. Bigot, *Ann. Soc. Ent. France, Bullet.*, 1882, pp. 68, 69.

**ægrotus**, Sensu Wiedem., *Ausser. Europ. Zweiflug. Ins.*, i, *Hamm*, 1830, p. 118 Synon, Eristalis, id. Fabr., *Syst. Antl.*, p. 243; Sensu. Osten.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1880, p. 437, Didea Ellenziederi, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 407, Syrphus fascipennis, Macq., *S. à Buff. Dipt.*, i, *Paris*, 1834, p. 537, et, Syrphus infirmus, Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 423; Sensu. Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 88.
Hab. China, Borneo, Ternate, Sumatra, Java, India, N. Ceram.

**trilimbatus**, J. Bigot, *Ann. Soc. Ent. France*, 1884, p. 86.
Hab. India.

**erythropygus**, id. ibid., p. 87.
Hab. India.

**nectarinus**, Wiedem. *Ausser. Europ. Zweiflug. Ins.* i, *Hamm*, 1830, p. 128; Sensu Osten-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1880, p. 438, Syrphus alternans, Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 89, et, triligatus, Walker, *Journl. Proceed. Linn. Soc., London*, i, p. 19; Sensu. V. d. Wulp, *Sumatra Expedit.*, p. 33, balteatus, de Geer, Meig., Macq., Zetterst., Alternata, Schrank, Nectarius, Fabr., Nectarinus, Fb. Wied.
Hab. China, Ternate, Java, Sumatra, India et Europa.

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**striatus**, V. d. Wulp, *Sumatra Exped.*, p. 32.
Hab. Sumatra.

**confrater**, Wiedem, *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 120.
Hab. China.

**neglectus**, id. ibid., p. 134.
Hab. Borneo, (Sensu Rondani).

**corollæ**, (Fabr. Europa) Wied. ibid., p. 121.
Hab. China; Europe.

**lunatus**, Wied., ibid., p. 121.
Hab. China.

**serarius**, id. ibid., p. 128.
Hab. China.

**virdaureus**, id. *Anal. Entom.* p. 35, p. 137.
Hab. Java.

**javanus**, id., *Analect. Entom.*, p. 34.
Hab. Java.

**scutellaris**, (G. Scœva), Fabr., *Syst. Antl.*, p. 252.
Hab. Tranquebar.

**coromandelensis**, Macq., *Dipt. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 89
Hab. Coromandel.

**assimilis**, id. ibid., *Supplt.* 1846, p. 135.
Hab. India.

**rufofasciatus**, id. ibid., *4th Supplt.*, 1850, p. 149.
Hab. Java.

**consimilis**, id. ibid., p. 150.
Hab. Java.

**mundus**, Walker, *Ins. Saunders, Dipt., London*, 1856, i, p. 230.
Hab. India.

**cranapes**, id. ibid., p. 231.
Hab. India.

**orsua**, id. ibid., p. 231.
Hab. India.

**opimius**, id. ibid., p. 232.
Hab. India.

**pedius**, id. ibid., p. 234.
Hab. India.

**cothonea**, id. ibid., p. 235.
Hab. India.

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**pleuralis**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1868-68, p. 497.
Hab. China.

**heterogaster**, id. ibid., p. 498.
Hab. China.

**macropterus**, id. ibid , p. 498.
Hab. China.

**divertens**, Walker, *Journl. Proceed. Linn. Soc., London*, 1857, p. 124.
Hab. Sarawak.

**cyathifer**, id. ibid., p. 125.
Hab. Sarawak.

**consequens**, id., ibid., 1857, p. 18.
Hab. Singapore.

**duplex**, id. ibid., p. 18.
Hab. Singapore.

**splendens**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1856, p. 410.
Hab. Java.

## Genus Melanostoma.

Schiner, *Wien. Ent. Monatschr.*, iv, 1860, p. 213; Syrphus, pt.

**univittata**, Sensu V. d. Wulp, V. d. Wulp, *Sumatra Exped.*, p. 33; Syrphus, id. Wiedem, *Anal. Entom.*, p. 36.
Hab. India.

**orientalis**, Ost.-Sacken, *Ann. Mus. Civ. d. Stor. Nat. d. Genova*, 1880, p. 437; Sensu Ost.-Sacken, Syrphus, id., Wiedem., *Anal. Entom.*, p. 36.
Hab. India.

## Genus Sphœrophoria.

St. Fargeau, Serville, *Encycl. Method.*, 1825; Synon. Melithreptus, Loew., *Isis.*, 1840, p. 573; Allograpta, pt. Ost.-Sacken, *Bullet. Buffalo. Soc.*, 1876; Mesogramma, vel Mesograpta, pt. Loew, *Dipt. Amer. Septentr. Indig. Centur.*, ii et vi.

**indiana**, J. Bigot, *Ann. Soc. Ent. France*, 1884, p. 99.
Hab. India.

**bengalensis**, Macq., *D. Exot.*, ii, 2nd Pt., *Paris*, 1842, p. 104.
Hab. India.

## Family Œstridi.

J. Bigot, *adhuc ined.*, 1891; Œstrides, Leach, *Edinb. Encycl.*, 1815; Œstridea, et, Œstridæ, Leach, 1817-19; Œstracides, Meig., *Syst. Beschr.*, iv,

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*Hamm*, 1824; Œstridœ, Rob. Desvoidy, *Myodaires*, 1830; Hæmatomyxæ, Fallen. Œstrides, Macq., *S. à Buff. Dipt.*, 1835; Œstridæ, Schiner, Œstrida, Œstrina, Hypodermina, Rondani, *Prodr.*, i, 1856, p. 19; Œstridii, J. Bigot, (*olim*), Oestriden, Brauer, 1863, *Verhandl. K. K. z. b. Gesellsch. Wien.*

### Genus Gastrophilus.

Leach., *Eprobosc. Ins. Werner. Soc.*, 1817; Gastrus, pt. Meig., 1824; Œstrus, pt. Latr.

**bengalensis**, Brauer. Sensu Brauer. Gastrophilus Equi, Fab., Macq., *Dipt. Exot.*, ii *Paris*, 1843, p. 25.
Hab. Bengal.

### Genus Therobia.

Brauer, *Verh. K. K. z. b. Gesellsch. Wien*, 1862, p. 1231; Trypoderma pt. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 256.

**abdominalis**, Brauer, (*loc. cit.*), p. 1231; Synon., Trypoderma, id. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 260.
Hab. Bengal.

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## II.—*Catalogue of the* Diptera *of the Oriental region by* Mons. J. M. F. Bigot. Part III. *Communicated by the* Superintendent of the Indian Museum.

[Received November 12th, 1891. Read December 2nd, 1891.]

### Circulus **CALYPTERICTI**.

J. Bigot, *adhuc inedict.* 1891.

### Family Myopicte.

J. Bigot, *adhuc inedict.* 1891.

### Genus Myopa.

Fabr., *Syst. Entom.*, 1775, p. 798. Conops, pt. (auctor) Phorosia, Myopella, id., Purpurellia, id., Gaustellia, id., Myopina, id., Tairmairia, id., Lonchopalpus, id., Pictina, id., pt, Rob. Desvoidy, Des Myopides, 1859 Gomrhynchus, Rondani Prodr. i, p. 58, 1856. Dalmannia, pt. Rob. Desv. Myod. 1830 p. 248, Sícus, pt., Latr. Prec. i, Caract. Ins. 1803.

**cincta**, Fabr. Syst. Antl., p. 181.
Hab. India.

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## Family PHASIADÆ.

J. Bigot, *adhuc inedict.* 1891.

Phasianeæ, Rob. Desv. Myod., 1830, pp. 25, 280, Westw. Meig. Rhysomyzæ, Fallen Phasiariæ, Zetterst., *Dipt. Scandin.*, 1841. Phasidæ, J. Bigot, (*olim*) Gastrodeæ, Rob. Desv. *loc. cit.* p. 235, Gymnolomæ, pt., Macq., *S. à Buff., Dipt.*, ii, 1835, p. 187, Paris. Phasinæ, Schin., Faun. Austriaca, d. Flieg., ii, p. 71, 1862, Phasina, Rond., *Prodr.* ii, pp. 22, 80, 1856.

### Genus GYMOSOMA.

Meig., *Illig. Magaz.*, ii, pp, 278, 1803, Tachina, pt., Latr. Meig. Ocyphro, pt., Fabr.

**indica**, Walker, *Insect. Saunders. Dipt.*, i, p. 257, *London*, 1856.
Hab. India.

### Genus PHASIA.

Latr., *Nouv. Dict. Hist. Nat.*, 1804; Thereva, pt., Meig. (*olim*).

**indica**, Walker, *Insect. Saunders., Dipt.*, p. 259, *London*, 1856.
Hab. India.

## Family TACHINIDÆ.

J. Bigot, *adhuc. inedict.* 1891 Creophilas Latr., *Fam. Nat.* Calypteratæ, pp. 21, 25 Tachinariæ, p. 185, Zoobiæ, p. 25, Entomobiæ, p, 26, pt., Rob. Desv., *Myod.*, 1830, Tachinariæ, Ocypteratæ, pt., Macq, *S. à Buff. Dipt.*, ii, pp. 59, 179, *Paris*, 1835; Tachinaridæ, J. Bigot, (*olim*) Tachininæ, Schiner, *Faun. Austr. d. Flieg.*, i, 1862, p. 423; Tachinina, Rondani, *Prodr.*, i, p. 59, 1856.

### Genus JURINIA.

Rob. Desvoidy, *Myod.*, 1830, p. 34; Synon., Jurinea, (*auctor*).

**indica**, id., ibid., p. 36.
Hab. India.

### Genus GONIA.

Meig., *Illig. Magaz.*, ii, p. 280, 1803; Reaumuria, p. 79, Rhedia, p. 74, Spallanzania, p. 78, Peleteria, p. 40, pt., Rob. Desv., *Myod.*, 1830; Isomera, pt. id., *Ann. Soc. Ent., France*, 1851, p. 315; Tachina, pt., Fall. (et auctor) Duvaucelia? Rob. Desv. *Myod.*, 1830, p. 227.

**javanica**, Rob. Desv., (Peleteria id.) *Myod.*, 1830, p. 40.
Hab. Java.

**atra**, id., (Rhedia, id.) ibid., p. 78.
Hab. Batavia, Cape of Good Hope (*Secundum*, Wied.)

**bicincta**, id., (Duvaucelia, id.) ibid., p. 228.
Hab. India.

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javana, Macq., *Dipt. Exot. Suit du 2nd Supplt.*, *Paris*, 1847, p. 43.
Hab. Java.

javana, (*nom. bislectum*), id., ibid., *4th Supplt.*, *Paris*, 1850, p. 178.
Hab. Java.

rufitibialis, id., ibid., p. 178.
Hab. Pondicherry.

indica, Brauer., (G. Trixomorpha), p. 163; Synon., Gonia id, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 305.
Hab. India.

œstroides, Walker, *Trans. Ent. Soc., London*, i, 1857, p. 13.
Hab. India.

minuta, V. d. Wulp, *Sumatra Exped.*, p. 35.
Hab. Sumatra.

## Genus Echinomyia.

Dumeril, *Zool. Anal*, 1806; Tachina, pt. Meig., *Illig. Magaz.*, 1803, p. 280, Fabricia, p. 42, Faurellia, p. 41, Peleteria, p. 39, Servillia, p. 49, Rob. Desv., *Myod.*, 1830.

rufo-analis, Macq., *Dipt. Exot.*, *4th Supplt.*, *Paris*, 1850, p. 169.
Hab. India.

tepens, Walker, *List. Dipt. Ins. Brit. Mus.*, *London*, iii, 1849, p. 723.
Hab. Sylhet.

sacontala, id. ibid., p. 723.
Hab. Nepal.

javana, V. d. Wulp, *Tijdschr. v. Entom.*, xxiii, p. 171; Synon. Tachina, id., Wiedem. *Zool. Magaz.*, iii, p. 24.
Hab. Java, Sumatra.

platymesa, Walker, *Trans. Ent. Soc.*, *London*, 1857, p. 7.
Hab. China.

brevipennis, Walker, *Journl. Proceed. Linn. Soc.*, *London*, i, 1857, p. 19.
Hab. Mount Ophir, Malacca.

lithanthrax, Wiedem., (Tachina, id.), *Ausser. Europ. Zweiflug. Ins.*, 2nd Part, *Hamm*, 1830, p. 283.
Hab. Java.

varia, Fabr. (Musca id.), *Ent. Syst.*, iv, p. 327.
Hab. India.

flavopilosa, J. Bigot, *Ann. Soc. Ent. France*, 1888, p. 80.
Hab. Java.

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## Genus Latreillia.

Rob. Desv., *Myod*, 1830, p. 104; Tachina, etc. (auctor.) pt.

**psamathe**, Walker, (Tachina, id.) *List. Dipt. Ins. Brit. Mus., London*, 1849, 4th Pt., p. 765.
Hab. Madras.

## Genus Meigenia.

Rob. Desv., *Myod*, 1830, p. 198.

**ciliata**, V. d. Wulp, *Sumatra Exped.*, p. 38.
Hab. Sumatra.

**latestriata**, id. ibid., p. 39.
Hab. Sumatra.

## Genus Masicera.

Macq., *S. à Buff., Dipt.*, ii, *Paris* 1835, p. 118; Tachina, pt. Phryxe, p. 158, Carulia, p. 176, Lydella, p. 112, pt. Rob. Desv., *Myod.*, 1830, Blepharipa, p. 71, Ceromasia, p. 71, pt. Rondani, *Prodr.*, i, p. 71, 1856.

**tenuisetosa**, Macq., *Dipt. Exot., Suit. du 2nd Supplt., Paris*, 1847, p. 46.
Hab. Java.

**niveiceps**, id. ibid., *4th Supplt.*, 1850, p. 191.
Hab. Java.

**cilipes**, V. d. Wulp, *Sumatra Exped.*, p. 36; Synon. Tachina, id., Macq., *Dipt. Exot.*, ii, 3rd Pt., p. 62, 1843.
Hab. India, Sumatra.

**vicaria**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 20.
Hab. Singapore.

**incivica**, id., *Trans. Ent. Soc., London*, 1857, p. 38.
Hab. India.

**albescens**, id. ibid., p. 11.
Hab. India.

**rubriventris**, V. d. Wulp, *Sumatra Exped.*, p. 37.
Hab. Sumatra.

**elongata**, id. ibid., p. 37.
Hab. Sumatra.

**longiseta**, id. ibid., p. 38.
Hab. Sumatra.

## Genus Nemoræa.

Rob. Desv., *Myod.* 1830, p. 71; Tachina, pt. (*auctor*), Ernestia, p. 60, Fausta, p. 62, Mericia, p. 64, Erigone, p. 65, Panzeria, p. 68, Meriania, p. 69,



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Winthemia, p. 173, pt., Rob. Desv. *loc. cit.*, Platychira, p. 64, Chatolyga, p. 66, Chetina, p. 65, Nemorilla, p. 66, pt. Rond. *Prodr.*, i, 1856.

**bicolor**, Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 182.
Hab. Java.

## Genus Phorocera.

Rob. Desv., *Myod.*, 1830, p. 131; Tachina pt. (*auctor.*), Doria, pt., Meig., *System Beschr.*, vii, *Hamm*, 1838, p. 263; Blondelia, p. 122, Pales, p. 154, Medina, p. 138, Rhynomya, p. 123, Latreillia, p. 104, pt., Rob. Desv. *loc. cit.*, Metopia, Lydella, pt. Macq., *S. à Buff. Dipt.*, ii, p. 121 et 132, 1835; Pericheta, p. 67, (alias Polycheta) Chetogena, p 68, Lecanipa, p. 156, (v. 3, 1859), Macharece, p. 159, (vol. 3, 1859), Bothria, p. 68, Campylocheta, p. 169, iii, 1859; Istocheta, p. 171, iii, 1859, pt. Rondani, *Prodr.*, i, 1856 et iii, 1859.

**javana**, Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 197.
Hab. Java.

**hyalipennis**, id. ibid., p. 197.
Hab. Java.

**sebina**, Walker., *List Dipt. Ins. Brit. Mus., London*, iii, 1849, p. 772.
Hab. Bengal.

## Genus Degeeria.

Meig., *Syst. Beschr*, vii, p. 249, *Hamm.* 1838; Tachina, pt., p. 139, Metopia, pt., p. 122, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, Medina, pt., Rob. Desv., *Myod.*, 1830, p. 138.

**albipes**, Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 202.
Hab. Java.

## Genus Blepharipeza.

Macq., *Dipt. Exot.*, ii, 3rd pt., 1843, p. 54; Blepharipa, Rondani, *Prodr.*, i, 1856, p. 71; Blepharipoda, p. 96, Trixomorpha, p. 163, Sisyropa, p. 163, pt. Brauer et Bergenstamm, *D. Zweiflug. d. K. Mus. z. Wien*, 1889; Gonia, pt. Walker, *List. Dipt. Ins. Brit. Mus. London*, 737, pt. 3, 1849.

**indica**, (G. Trixomorpha, Brauer, p. 163); Wiedem, (G. Tachina ?)
Hab. India, Bengal.

**thermophila**, (G. Sisyropa, p. 163, Brauer); Brauer, *loc. cit.* Synon. Tachina, id., Wiedem., *Ausser. Europ. Zwiflug. Ins*, ii, *Hamm*, 1830, p. 325.
Hab. Java.

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## Genus Zambeza.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 21.

**ocypteroides**, id. ibid., p. 21.
Hab. Singapore.

## Genus Tachina.

Meig., *Illig. Magaz.*, ii, 1803, p. 280; Oodigaster, pt. Macq., *Ann. Soc. Ent. France*, ii, 1854; Voria, p. 195, Acemyia, p. 202, Marshamia, p. 57, pt., Rob.-Desv., *Myod.*, 1830.

**cinerea**, (Musca Tub.), Fabr., *Ent. Syst.*, iv, p. 331.
Hab. India.

**potans**, (Marshamia, R.-Desv.) Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., p. 299, *Hamm.*
Hab. China.

**sugens**, id. ibid., p. 306.
Hab. Java.

**rufifrons**, id. ibid., p. 318.
Hab. China.

**convergens**, id. ibid., p. 320.
Hab. India.

**nigricornis**, id. ibid., p. 322.
Hab. India.

**munda**, id., ibid. p. 324.
Hab. Tranquebar.

**flavipennis**, id., *Anal. Entomol.*, p. 44.
Hab. India.

**metallica**, id. ibid., p. 46.
Hab. India.

**errans**, id. ibid., p. 44.
Hab. India.

**macularis**, id. ibid., p. 45.
Hab. India.

**mellea**, id. ibid., p. 46.
Hab. Java.

**viridiaurea**, id. ibid., p. 43.
Hab. India.

**nigriventris**, id. ibid., p. 43.
Hab. India.

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**molitor**, id. ibid., p. 46.
Hab. India.

**orientalis**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 333.
Hab. India.

**innocens**, id. ibid., p. 336.
Hab. China.

**orbata**, id. ibid., p. 336.
Hab. India.

**fasciata**, id. ibid., p. 337.
Hab. China, (Macao).

**salva**, id. ibid., p. 340.
Hab. China.

**javana**, Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 204.
Hab. Java.

**bomboides**, Walker, *Ins. Saunders, Dipt.*, i, *London*, 1856, p. 271.
Hab. India.

**nitida**, id. ibid., p. 271.
Hab. India.

**sobria**, id. ibid., p. 272.
Hab. India.

**subcinerea**, id. ibid., p. 272.
Hab. India.

**dorsalis**, id. ibid., p. 275.
Hab. Java.

**fulva**, id. ibid., p. 276.
Hab. India.

**grandis**, id. ibid., p. 278.
Hab. India.

**atriventris**, id. ibid., p. 290.
Hab. India.

**umbrosa**, id. ibid., p. 291.
Hab. India.

**adusta**, id. ibid., p. 292.
Hab. India.

**alta**, id. ibid., p. 293.
Hab. India.

**tricincta**, id. ibid., p. 301.
Hab. India.

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**ophirica**, id. ibid., 1857, p. 19.
Hab. Mount Ophir.

### Genus Linnemyia.

Rob. Desvoidy, *Myod.*, p. 52, 1830; Tachina, pt., (auctor).

**titan**, Walker, *List. Dipt. Ins. Brit. Mus., London*, iv, p. 735, 1849.
Hab. Sylhet.

### Genus Lydella.

Rob. Desvoid., *Myod.*, p. 112, 1830; Tachina, pt., (auctor.)

**lucagus**, Walker, *List. Dipt. Ins. Brit. Mus., London*, iv, p. 768, 1849.
Hab. China.

### Genus Myobia.

Rob. Desv., *Myod.*, p. 99, 1830; Tachina, pt. Orellia, p. 765, *loc. cit.*, Solieria, *Ann. Soc. Ent. France*, 1841, 48, pt. Rob. Desv.

**nigripes**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1856, deel x, p. 411.
Hab. Java.

**robusta**, V. d. Wulp, *Sumatra Exped.*, p. 40.
Hab. Sumatra.

### Genus Eurigaster.

Macq., *S. à Buff. Dipt.*, ii, p. 115, *Paris*, 1835; Tachina, pt. (auctor.), Phryno, p. 143, Roesellia, p. 145, pt., Rob. Desv., *Myod.*, 1830.

**subferrifera**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 125.
Hab. Borneo.

**muscoides**, id. ibid., p. 20.
Hab. Singapore.

**languida**, id., *Trans. Ent. Soc., London*, iv, Pt. vi, 1857, p. 198.
Hab. India.

**cuprescens**, id. ibid., p. 196.
Hab. India.

### Genus Orectocera.

V. d. Wulp, *Sumatra Exped.*, p. 39.

**micans**, id. ibid., p. 40.
Hab. Sumatra.

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## Genus Hermyia.

Rob. Desv., *Myod.*, p. 226, 1830; Tachina, pt. (auctor).

**beelzebub**, J. Bigot, Synon. Tachina, id., Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 301.
Hab. Java.

**imbuta**, J. Bigot, Synon. Tachina, id., Wiedem, *loc. cit.*, p. 302; Paralophosia ? Brauer, *d. Zweiflug. d. K. Mus. z. Wien.*, 1889, p. 164.
Hab. India.

**alacris**, J. Bigot, Synon. Tachina, id., *loc. cit.*, p. 303.
Hab Java.

## Genus Exorista.

Meig., *Illig. Magaz.*, ii, p. 280, 1803; Tachina, pt. (auctor.); Senometopia, p. 104, Lydella, p. 132, Masicera, p. 118, Eurigaster, p. 115, pt., Macq., Dipt., *S. à Buff.*, ii, *Paris*, 1835; Hubneria, p. 602, Dorbinia, pt., p. 272, Rob. Desv., *Ann. Soc. Ent. France*, 1847, Carcelia, p. 176, Phryno, p. 143, Phryxe, p. 158, Zenillia, p. 152, Winthemia, p. 173, Rob. Desv., *Myod.*, 1830, Lomacantha, pt., p. 151, Vol. 3, 1859, Aporomyia, pt., Vol. 3, p. 90 (*nota*) ibid, Rondani, *Prodr.*

**fasciata**, Jaennicke, *N. Exot. Dipter.*, *Frankfort*, 1867, p. 75.
Hab. Java.

## Genus Thryptocera.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 87; Tachina pt. (auctor.); Actia, p. 85, Osmæa, p. 84, Necera, p. 84, pt. Rob. Desv., *Myod.*, 1830, Herbstia, p. 10, Ramburia, pt., p. 17, id., *Ann. Soc. Ent., France*, 1851; Bigonicheta, p. 61, pt., Rondani, *Prodr.*, i, 1856.

**setinervis**, Thomson, *Frigatt Eugenie's Resa*, *Stockholm*, 1858-68, p. 519.
Hab. China.

## Genus Blepharella.

Macq., *Dipt. Exot.*, *4th Supplt.*, *Paris*, 1850, p 203.

**lateralis**, id. ibid., p. 204.
Hab. Pondicherry.

## Genus Ochropleurum.

Macq., *Dipt. Exot.*, *4th Supplt.*, *Paris*, 1850, p. 212.

**javanum**, id. ibid., p. 212.
Hab. Java.

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### Genus Crossotocnema.

J. Bigot, *Ann Soc. Ent. France*, 1885, p. 207.

**javana**, id. ibid., p. 208.
Hab. Java.

## Family DEXIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Dexiariæ, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 205; Dexina, Rondani, *Prodr.*, i, p. 23, 1856; Dexinæ, Schiner, 1862, *Faun. Austriaca, d. Flieg.*, p. 1.

### Genus Dexia.

Meig., *Syst. Beschr.*, v, 1826, p. 33; Dexilla, Westw. Myocera, p. 328; Catilia, 310, Estheria, p 305, Thelaira, p. 214, Zelia, p. 314, Sophia, p. 317, pt., Rob. Desv., *Myod.*, 1830.

**lepida**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 376.
Hab. Java.

**macropus**, id. ibid, p. 375.
Hab. Java.

**javanensis**, Macq., *S. à Buff. Dipt*, ii, *Paris*, 1835, p. 214.
Hab. Java.

**subcompressa**, Walker, *Ins. Saunders, Dipt.*, i, *London*, 1856, p. 313.
Hab. India.

**festiva**, V. d. Wulp., *Sumatra Exped.*, p. 41.
Hab. Sumatra? Java?

**munda**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 126.
Hab. Borneo.

**extendens**, id. ibid, p. 126.
Hab. Borneo.

**divergens**, id. ibid., 1857, p. 21.
Hab. Singapore.

### Genus Rutilia.

Rob. Desv., *Myod.*, 1830, p. 319.

**angusticarinata**, Macq, *Dipt. Exot., Suit. du 2nd Supplt., Paris*, 1847, p. 5.
Hab. Java.

**flavipennis**, id. ibid., p. 50.
Hab. Java.

**nitens**, id. ibid., *4th Supplt., Paris*, 1850, p. 216.
Hab. India.

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### Genus Silbomyia.

Macq., *Dipt. Exot.*, ii, 3rd Pt., p. 118, *Paris*, 1843; Musca, pt. Fabr., Wied.

**micans**, Macq., *Dipt. Exot.*, (*loc. cit.*), p. 118; Synon., Musca, id. Fabr., *Syst. Antl.*, p. 291.
Hab. India, Sumatra, Java.

**fuscipennis**, id. ibid., p. 119; Synon. Musca, id. Fabr. ibid., p. 291.
Hab. Java, Sumatra.

**infixa**, Walker, (*Musca*) *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 25.
Hab. Singapore.

**fumipennis**, id. ibid., p. 25.
Hab. Singapore.

### Genus Morinia.

Rob. Desv., *Myod.*, 1830, p. 264; Dexia, pt. Volucella, pt., Schrank. Melanophora, pt., Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 173; Melanomya, pt. Rondani, *Prodr.*, i, 1856, p. 88.

**chloe**, V. d. Wulp, *Sumatra Exped.*, p. 42; Synon. Dexia, id. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 383.
Hab. Sumatra.

### Family Sarcophagidæ.

Sarcophagii, Macq., *S. à Buff. Dipt.*, ii, 1835, p. 219; Theramydæ, Rob. Desv., *Myod.*, 1830, pp. 25, 302; Sarcophagiæ, Zetterst., *Dipt. Scand.*, i, 1842, p. 5; Sarcophaginæ, Schin., 1862, *Faun. Austriaca, D. Fliegen.*, 1st Pt., p. 70; Sarcophageæ, Westw. Dexinæ, pt. Rondani, *Prodr.*, i, 1856, p. 23.

### Genus Megistogaster.

Macq., *Dipt. Exot.*, *4th Supplt.*, *Paris*, 1850, p. 212; Dexia? pt. (auctor.).

**fuscipennis**, id. ibid., p. 213.
Hab. Java.

**costatus**, Rondani, *Ann. d. M. Civ. d. Stor. Nat. d. Genova.*, vol. vii, 1875, p. 423.
Hab. Sarawak.

**imbrasus**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 126; Synon. Tachina, id., *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 781.
Hab. Borneo, China.

### Genus Cordyligaster.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 90; Dexia? pt. (auctor.).

**fuscifacies**, J. Bigot, *Ann. Soc. Ent. France*, 1888, p. 101.
Hab. Java.

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### Genus Doleschalla.

Walker, *Journ. Proceed. Linn. Soc., London*, 1861, p. 242; Dexia? pt. (auctor.).

**nigra**, J. Bigot, *Ann. Soc. Ent. France*, 1888, p. 98.
Hab. Indian Archipelago.

**picta**, id. ibid., p. 99.
Hab. Indian Archipelago.

### Genus Rhaphis.

V. D. Wulp, *Tijdschr. v. Entom.*, xviii, 1885, p. 199; Dexia? pt. (auctor.).

**elongata**, id. ibid., p. 200.
Hab. Ceylon.

### Genus Catapicephala.

Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 237.

**splendens**, id. ibid., p. 237.
Hab. Java.

### Genus Phrissopodia.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 222; Peckia, Rob. Desv., *Myod.*, 1830, p. 335.

**metallica**, V. d. Wulp, *Sumatra Exped.*, p. 43.
Hab. Sumatra.

### Genus Sarcophaga.

Meig., *Syst. Beschr.*, v. p. 14, 1826, et, auctor.; Phorella, p. 362, Agria, p. 376, Rob. Desv., *Myod.*, 1830.

**ruficornis**, Fabr., *Ent. System.*, iv, p. 314, 6.
Hab. India.

**princeps**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 359.
Hab. Sumatra.

**tænionota**, id. ibid., p. 360.
Hab. Java, Tranquebar.

**tenuipalpis**, Macq., *Dipt. Exot.*, ii, 3rd pt., *Paris*, 1843, p. 101.
Hab. Pondicherry.

**lineatocollis**, id. ibid., p. 101.
Hab. Java, Coromandel.

**javana**, id. ibid., *4th Supplt., Paris*, 1850, p. 232.
Hab. Java.



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**sericea**, Walker, *Ins. Saunders. Dipt*, vol. i, *London*, 1856, p. 326.
Hab. India.

**reciproca**, id., *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 22.
Hab. Malacca.

**aliena**, id. ibid., p. 22.
Hab. Java.

**rufipalpis**, V. d. Wulp, Sumatra Exped., p. 42.
Hab. Sumatra.

**emigrata**, Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 424.
Hab. Sarawak.

**indicata**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 127.
Hab. Borneo.

## Genus Sarcophila.

Rondani, *Prodr*, i, 1856, p. 86; Sarcophaga, Agria, pt.

**alba**, Schiner, *Novar. Reise*, 1868, p. 315.
Hab. Ceylon.

## Genus Myophora.

Rob. Desv., *Myod.*, 1830, p. 337; Sarcophaga, pt. (auctor.).

**fulvicornis**, id. ibid., p. 341.
Hab. Bengal.

**duvaucelii**, id. ibid., p. 351.
Hab. Bengal.

## Genus Morellia.

Rob. Desv., *Myod.*, 1830, p. 405.

**affixa**, (*Musca*) Walker, *Journ. Proceed. Linn. Soc., London*, i, 1857, p. 27.
Hab. Singapore.

## Genus Cynomyia.

Rob. Desv., *Myod.*, 1830, p. 363; Sarcophaga, pt. (auctor.), Volucella, pt. Schrank.

**violacea**, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 233.
Hab. Java.

**fortis**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 127.
Hab. Borneo.

**fulviventris**, Rondani, *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1875, p. 425.
Hab. Sarawak.

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## Family OCYPTERIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Ocypteræ, Meig., *Syst. Beschr.*, iv, 1824; Ocypteratæ, Rob. Desv., *Myod.*, 1830, p. 222; Rhyzomyzæ, pt. Fallen. Ocypteratæ, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 179; Ocypterinæ, Schin., *Faun. Austr., d. Fliegen.*, 1862, p. 41; Tachinina, pt. Rond., *Prodr.*, i, 1856, pp. 22, 59.

### Genus PHANIA.

Meig., *Syst. Beschr.*, iv, 1824, p. 218.

**indica**, Walker, *Ins. Saunders.*, i, *London*, 1856, p. 261.
Hab. India.

### Genus DUVAUCELIA.

Rob. Desv., *Myod.*, 1830, p. 227.

**bicincta**, id. ibid., p. 228.
Hab. Bengal.

### Genus OCYPTERA.

Latr., *Dict. Hist. Nat.*, 1904; Syrphus, pt. Panzer; Besseria, pt., Rob. Desv., *Myod.*, 1830, p. 232; Ocypterula, Exogaster, pt. Rondani, *Prodr.*, i, 1856, p. 78.

**bicolor**, Wiedem., *Zool. Magaz.*, iii.
Hab. India.

**fuscipennis**, id. ibid.
Hab. India.

**umbripennis**, V. d. Wulp, *Sumatra Exped.*, p. 35.
Hab. Sumatra.

## Family ACHIASIDÆ.

J. Bigot, *adhuc inedict.*, 1891.

### Genus ACHIAS.

Fabr., *Syst. Antl.*, 1805; Ancæropsis, pt., J. Bigot, *Ann. Soc. Ent. France*, 1866, p. 201.

**oculatus**, Fabr., *Syst. Antl.*, 1805.
Hab. Java.

**ichneumonea**, Westw., *Trans. Ent. Soc.*, v, *London*, 1850, p. 7.
Hab. India.

**horsfieldii**, id. ibid., p. 7.
Hab. India.

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## Family MUSCIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Muscidæ, Latr., *Hist. Nat. d. Ins.*, 1802; Musceformes, pt. Meig., *System Ceschreib.*, i, 1818; Muscidæ, pt. Leach., *Sam. Comp.*, 1819; Muscina, pt. Rob. Desvoidy, *Myod.*, 1830, p. 406; Muscariæ, pt. Zetterst., *Dipt. Scandin.*, 1842; Muscodæ, Muscina, Rond., *Prodr.*, i, 1856, pp. 23, 39; Muscides, Walker, Musceæ, Westw., Muscidi, pt., J. Bigot, (*olim*), Muscidæ, Schin., *Faun. Austriac. d. Fliegen*, i, 1862, p. 398; Muscidiæ, pt. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 262; Musciæ, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 235; Anthomyzidæ, pt. (auctor.).

### Genus STOMOXIS.

Geoffr., *Hist. d. Ins.*, i, 1764; Conopts, pt. Linn.; Musca, pt. Degeer; Hæmatobia, pt. Rob. Desv., *Myod.*, 1830, p. 388; Syperosia, pt. Rond., *Prodr.*, i, 1856, p. 93.

**libatrix**, Rob. Desv., *Myod.*, 1830, p. 387.
Hab. Coromandel.

**flavipennis**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 248.
Hab. Java.

**calcitrans**, Linn. (et auctor.), V. d. Wulp, *Sumatra Exped.*. p. 43; Schiner, *Novar. Reise*, 1868, p. 311.
Hab. Sumatra, Java, Batavia, Ceylon, Sydney, Europe.

**plurinotatus**, J. Bigot, *Soc. Zool. France, Paris*, 1887, p. 593.
Hab.

### Genus RHYNCHOMYA.

Rob. Desv., *Myod.*, 1830, p. 424; Tachina, pt. Meig., 1802; Idia, pt. Loew.

**bicolor**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 125.
Hab. Pondicherry.

**obsoleta**, Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 810; Synon. Idia, id. Wiedem., *Ausser. Europ. Zweiflug. Ius.*, 2nd Pt., *Hamm*, 1830, p. 355.
Hab.

**pallicops**, J. Bigot, *Soc. Zool. France, Paris*, 1887, p. 594.
Hab. India.

**plumata**, Schiner, *Novar. Reise*, 1868, p. 315.
Hab. Ceylon.

**aberrans**, id. ibid., p. 316.
Hab. China.

**indica**, Rond., *Ann. d. Mus. Civic. d. Stor. Nat. d. Genova*, vol. vii, 1875, p. 424.
Hab. Sarawak.

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## Genus Stomorhina.

Rondani, *Prodr.*, iv, 1861, p. 9; Idia, pt. Muscina, pt. Rondani.

**quadrinotata,** (Idia) J. Bigot, *Ann. Soc. Ent. France*, 1874, p. 238; Synon. Muscina, id. Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 429.
Hab. Borneo.

**bivittata,** id., *Soc. Zool. France*, 1887, p. 592.
Hab. India.

## Genus Rhinia.

Rob. Desv., *Myod.*, 1830, p. 422; Idia (auctor.) pt.

**testacea,** Schin., *Novar. Reise*, 1868, p. 310; Synon. Idia, id. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 246.
Hab. Nicobar Islands and Ile d. France.

**fulvipes,** J. Bigot, *Ann. Soc. Ent. France*, 1874, p. 239.
Hab. Ceylon.

## Genus Idia.

Meig., *Syst. Beschr.*, v, 1826, p. 1802; Musca, pt. (auctor.).

**xanthogastera,** (*nomen bislectum*), Rob. Desv., *Myod.*, 1830, p. 420.
Hab. Java.

**flavipes,** id. ibid., p. 420.
Hab. India.

**bengalensis,** id. ibid., p. 421.
Hab. Bengal.

**xanthogaster,** Wiedem, *Nov. Dipter. Gener.*, p. 21.
Hab. Java.

**mandarina,** id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Part, *Hamm*, 1830, p. 350.
Hab. China.

**discolor,** Fabr. *Ent. Syst.*, iv, p. 320.
Hab. India, Java.

**melanostoma,** Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 350.
Hab. Java.

**metallica,** Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 246.
Hab. Bengal.

**flavipennis,** id., *Dipt. Exot.*, ii, 3rd Pt. *Paris*, 1843, p. 125.
Hab. Java.

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**limbipennis**, id. ibid., *Suit. d. 2nd Supplt., Paris*, 1847, p. 54.
Hab. Java.

**marginata**, id. ibid., *4th Supplt., Paris*, 1850, p. 249.
Hab. Java.

**quadrimaculata**, id. ibid., p. 240.
Hab. Java.

**unicolor**, id. ibid., p. 240.
Hab. Java.

**lateralis**, V. d. Wulp, *Sumatra Exped.*, p. 44.
Hab. Sumatra.

**tenebrosa**, Walker, *Journal, Proceed. Linn. Soc., London*, i, 1857, p. 23.
Hab. Java.

**bicolor**, id. ibid., p. 23.
Hab. Malacca.

**bivittata**, id. ibid., 1856, p. 128.
Hab. Borneo.

**simplex**, id., *Trans. Ent. Soc.. London*, 1857, p. 24.
Hab. India.

**tripartita**, J. Bigot, *Ann. Soc. Ent. France*, 1874, p. 236.
Hab. India.

**nigricauda**, id. ibid., p. 237.
Hab. Burma.

**cincta**, id. ibid., p. 238.
Hab. Ceylon.

**fulvipes**, id. ibid., p. 239.
Hab. Ceylon.

## Genus Cosmina.

Rob. Desv., *Myod.*, 1830, p. 423; Idia pt.

**varia**, (G. Idia), Walker, *Ins. Saunders, Dipt.*, vol. i, *London*, 1856, p. 350.
Hab. Ceylon?

**micans**, J. Bigot, *Ann. Soc. Ent. France*, 1874, p. 241.
Hab. Pulo-Penang.

**pinangiana**, id. ibid., p. 241.
Hab. Pulo-Penang.

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## Genus Bengalia.

Rob. Desv., *Myod.*, 1830, p. 425; Ormia, pt., ibid, p. 428.

**labiata,** id. ibid., p. 426.
Hab. Bengal.

**pallens,** id. ibid., p. 426.
Hab. Bengal.

**melanocera,** id. ibid., p. 426.
Hab. Bengal.

**lateralis,** Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris.* 1843, p. 120.
Hab. Pondicherry.

**diocles,** (G. Musca), Walker, *List. Dipt. Ins. Brit. Mus.*, Pt. iv, *London*, 1849, p. 869.
Hab. Borneo.

## Genus Phormia.

Rob. Desv., *Myod*, 1830, p. 465.

**dotata,** (G. Musca), Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 25.
Hab. Singapore.

## Genus Phumosia.

Rob. Desv., *Myod*, 1830, p. 427.

**fulvicornis,** J. Bigot, *Soc. Zool. France*, 1887, p. 611.
Hab. Java.

## Genus Ochromyia.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 248; Bengalia, p. 425, Ormia, p. 428; Palpostoma, p. 429, pt. Rob. Desv., *Myod.*, 1830.

**jejuna,** Macq., id. ibid., p. 249; Synon. Musca, id. Fabr., *Syst. Antl.*, Bengalia testacea, Rob. Desv., *Myod.*, 1830, p. 426.
Hab. Bengal, Java, Australia, Cayenne?

**fasciata,** id., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 133.
Hab. India.

**javana,** id. ibid., *Supplt.*, *Paris*, 1846, p. 196.
Hab. Java.

**bicolor,** V. d. Wulp, *Sumatra Exped.*, p. 45.
Hab. Sumatra.

**quadrinotata,** J. Bigot, *Soc. Zool. France*, 1887, p. 608.
Hab. Ceylon.

**fulvescens,** id. ibid., p. 609.
Hab. Indian Archipelago.

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## Genus Morellia.

Rob. Desv., *Myod.*, 1830, p. 405; Musca, pt.

**affixa**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 27.
Hab. Java.

## Genus Calliphora.

Rob. Desv., *Myod.*, 1830, p. 433; Musca, Lucilia, pt. (auctor.), Melinda, pt., p. 439, Rob. Desv. *loc. cit.*

**rufipes**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 129.
Hab. Java.

**fulviceps**, V. d. Wulp, *Sumatra Exped.*, p. 44.
Hab. Sumatra.

## Genus Melinda.

Rob. Desv., *Myod.*, 1830, p. 439; Calliphora, pt. (auctor.).

**metilia**, (Musca), Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 898.
Hab. Nepal.

## Genus Catapicephala.

Macq., *Dipt. Exot.*, *4th Supplt.*, *Paris*, 1850, p. 237.

**splendens**, id. ibid., p. 237.
Hab. Java.

## Genus Cynomyia.

Rob. Desv., *Myod.*, 1830, p. 363; Musca, Volucella, Schrank, Sarcophaga, (auctor.).

**violacea**, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 233.
Hab. Java.

**quadrivittata**, id. ibid., *5th Supplt.*, 1855, p. 108.
Hab. India.

## Genus Curtonevra.

(Cyrtonevra vel Curtonevra, *olim*), Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 274; Musca, Anthomyia, pt. (auctor.); Morellia, p. 405, Muscina, p. 406, Rob. Desv., *Myod.*, 1830.

**pruinosa**, V. d. Wulp, *Tijdschr. v. Entom.*, 1879–80, p. 24.
Hab. Java.

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## Genus Chrysomya.

Rob. Desv., *Myod.*, 1830, p. 444; Lucilia, pt. (auctor.)

**duvaucelii**, Rob. Desv., id. ibid., p. 451.
Hab. Bengal.

**tifata**, (Musca), Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 871.
Hab. China.

**remuria**, (Musca), id. ibid., p. 871.
Hab. China.

**flaviceps**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 23; Synon. Lucilia, id. Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 145.
Hab. Coromandel.

**chrysoides**, id. ibid., p. 23.
Hab. Java, Indian Archipelago.

## Genus Somomya (*Sic*).

Rondani, *Bertol.. G., Affid. Acad. d. Bologna*, 1862; Musca, Calliphora, Lucilia, pt. (auctor.); Phormia, p. 465, Melinda, p. 439, Mufetia, p. 431, Chrysomya (*Sic*), p. 444; Rob. Desv., *Myod*, 1830; Mya, pt., (*olim*), Rondani, *Prodr.*, i, 1856, p. 90; Myochrysa, id., *Arch. d. l. Soc. d. Zool.*, iii, 1864, p. 28.

**pagodina**, J. Bigot, *Ann. Soc. Ent. France*, 1877, p. 40.
Hab. Pondicherry.

**fuscocincta**, id. ibid., p. 40.
Hab. Assam.

**rubiginosa**, id. ibid., p. 41.
Hab. Burma.

**birmanensis**, id. ibid., p. 41.
Hab. Burma.

**infumata**, id. ibid., p. 42.
Hab. Burma.

**versicolor**, id. ibid., p. 42.
Hab. Ceylon.

**obesa**, id. ibid., p. 43.
Hab. Ceylon.

**cœruleocincta**, id. ibid., p. 43.
Hab. Pulo-Pinang.

**pictifacies**, id. ibid., p. 45.
Hab. Java.



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**cœruleolimbata**, id., *Soc. Zool. France*, 1887, p. 599.
Hab. Java.

**dives**, id. ibid., p. 600.
Hab. Calcutta.

**atrifacies**, id. ibid., p. 601.
Hab. Calcutta.

**melanorhina**, id. ibid., p. 602.
Hab. Java, Ternate, Waigiou, New Guinea.

**pachysoma**, id. ibid., p. 603.
Hab. Java.

**nitidifacies**, id. ibid., p. 603.
Hab. Java.

**cyanecincta**, id. ibid., p. 604.
Hab. Java, Ternate, Timor.

**nebulosa**, id. ibid., p. 604.
Hab. Java, Ternate.

**xanthomera**, Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 427.
Hab. Borneo.

## Genus Plinthomyia.

Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 427; Ochromyia, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 248.

**emimelania**, id. ibid., p. 128.
Hab. Borneo.

## Genus Lucilia.

Rob. Desv., *Myod.*, 1830, p. 452; Musca, Calliphora, Melinda, Chrysomyia, Somomya, pt. (auctor).

**bengalensis**, id. ibid., p. 460.
Hab. Bengal.

**brevigaster**, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 256.
Hab. Java.

**flavidipennis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 139; Synon. Sensu V. d. Wulp, *Sumatra Exped.*, p. 46; L. philippensis, Macq., *Dipt. Exot.*, ii, 3rd Pt., p. 146; L. flavicalyptrata, id., *loc. cit.*, *Suit du 2nd Supplt.*, 1847, p. 55; L. cæruleifrons, id. ibid., *4th Supplt.*, 1850, p. 248; L. indica, p. 453, et, L. eximia, p. 456, Rob. Desv., *Myod.*, 1830.
Hab. Bengal, Coromandel, Sumatra, Java, Timor.

**porphyrina**, (Musca), Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 24.
Hab. Mount Ophir.

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**trita,** (Musca), id. ibid., p. 24.
Hab. Malacca.

**defixa,** (Musca), id. ibid., p. 24.
Hab. Singapore.

**divisa,** (Musca), id., *Ins. Saunders., Dipt., London,* 1856, p. 333.
Hab. India.

**inducta,** (Musca), id. ibid., p. 335.
Hab. India.

**polita,** (Musca), id. ibid., p. 338.
Hab. India.

**serenissima,** (Musca), id. ibid., p. 340.
Hab. India.

**temperata,** (Musca), id. ibid., p. 340.
Hab. India.

**chalybea,** (Musca), Wiedem., *Ausser. Europ. Zweiflug. Ins.,* 2nd Pt., *Hamm,* 1830, p. 402.
Hab. Java.

**phellia,** (Musca), Walker, *List. Dipt. Ins. Brit. Mus.,* iv, *London,* 1849, p. 884.
Hab. Bengal.

**dux,** Eschh., *Entomogr.*, i, p. 114; Synon. Sensu, V. d. Wulp, *Sumatra Exped.*, p. 46; Musca, id. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm,* 1830, p. 406; Compsomyia, id. Rond., *Ann. Mus. Civ, d. Stor. Nat. Genova,* 1875, p. 426; Lucila flaviceps, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris,* 1843, p. 145; Chrysomya duvaucelii, Rob. Desv., *Myod.*, 1830, p. 451; Compsomyia, Rondani, *Ann. Mus. Civ. d. Stor. Nat. Genova,* 1875, p. 426.
Hab. Pondicherry, Ceylon, China, Borneo, Coromandel, Aru, Wokan, Kandari, Celebes.

**cærulea,** Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris,* 1843, p. 140; Synon. Musca, id. Wied., *Zool. Magaz.*, iii, p. 23.
Hab. Java.

**orientalis,** Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris,* 1843, p. 145.
Hab. Pondicherry, Sumatra.

**ruficornis,** id. ibid., *2nd Supplt.*, 1847, p. 84.
Hab. India.

**vittata,** id. ibid., *Suites du 2nd Supplt.*, 1847, p. 56.
Hab. Java.

**ruficeps,** id. ibid., p. 56.
Hab. Java.

**cyanea,** id. ibid., *4th Supplt.*, p. 248.
Hab. Java.

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**abdominalis**, (Musca), Fabr., *Syst. Antl.*, p. 294.
Hab. India.

**rectinervis**, Macq., *Dipt. Exot.*, *5th Supplt.*, *Paris*, 1855, p. 111.
Hab. India.

**virens** (Musca), Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 409.
Hab. Java.

**lauta** (Musca), id. ibid., p. 410.
Hab. Java.

**ligurriens** (Musca), id. ibid., p. 655.
Hab. Java, China.

**viridiaurea** (Musca), id., *Zool. Magaz.*, iii, p. 22.
Hab. Java.

**pinguis** (Musca), Walker, *Journl. Proceed. Linn. Soc.*, *London*, i, 1857, p. 25.
Hab. India.

**leucodes**, Frauenfeld, *Verh. K. K. z. b. Gesellsch.*, Wien, xvii, p. 453.
Hab. Singapore.

**pavonina**, Schiner, *Novar. Reise*, 1868, p. 305.
Hab. Nicobar Islands.

**leonardi**, Weyenberg, *Archiv. Nederland*, iv, 1869, p. 41.
Hab. Serorabaja.

## Genus Zona.

Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 806; Tephritis, pt. Gray.

**violacea**, id. ibid., p. 806; Synon. Tephritis, id., Griffith, *Anim. Kingd.*
Hab. Nepal.

## Genus Compsomyia.

Rondani, *Ann. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 425; Lucilia, Calliphora, pt.

**accincta**, id. ibid., p. 426.
Hab. Borneo.

**cœruleivirens**, id. ibid., p. 426.
Hab. Borneo.

**violaceinitens**, id. ibid., p. 426.
Hab. Borneo.

## Genus Pyrellia.

Rob. Desveidy, *Myod.*, 1830, p. 462; Musca, Lucilia, pt. (auctor).

**violacea**, Macq., *Dipt. Exot.*, *4th Supplt.*, *Paris*, 1850, p. 251.
Hab. Asia, Sumatra (V. d. Wulp).

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**sivah**, J. Bigot, *Ann. Soc. Ent. France*, 1878, p. 33.
Hab. India.

**stella**, id. ibid., p. 34.
Hab. Ceylon.

**diffidens** (Musca), Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 26.
Hab. Singapore.

**confixa** (Musca), id. ibid., p. 26.
Hab. Java, Mt. Ophir.

**refixa** (Musca), id. ibid., p. 26.
Hab. Singapore.

**perfixa** (Musca), id. ibid., p. 26.
Hab. Java, Mt. Ophir.

**exempta** (Musca), id. ibid., 1857, p. 128.
Hab. Borneo.

## Genus METALLEA.

V. d. Wulp, *Tijdschr. v. Entom.*, deel xxiii, 1870–80, p. 22.

Hab. Java.

## Genus SYNAMPHONEURA.

J. Bigot, *Ann. Soc. Ent. France*, 1886, *bulletin*, p. 14.

**cuprina**, id. ibid.
Hab. Java.

## Genus POLLENIA.

Rob. Desv., *Myod.*, 1830, p. 412; Musca, pt. (auctor.) Nitellia, p. 417, pt. Rob. Desv.

**reflectens**, Walker, *Journl. Proceed. Linn. Soc., London*, 1856, p. 24.
Hab. Malacca.

**munda**, Ost.-Sacken, *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1881, p. 450; Synon. Musca id. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 398.
Hab. Java.

## Genus MUSCA.

Linn., *Faun. Suec.*, 1763, p. 439; Volucella, pt. Schrk., Plaxemya, p. 392, Byomya, p. 392, pt. Rob. Desv., *Myod.*, 1830.

**varicolor**, Fabr., *Syst. Antl.*, p. 296.
Hab. Tranquebar.

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**adumbrata**, id., *Anal. Entom.*, p. 48.
Hab. Java.

**hortensia**, id. ibid., p. 49.
Hab. Java.

**planiceps**, id. ibid., p. 48.
Hab. Java.

**albina**, Wied., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 415.
Hab. India.

**hortulana**, id. ibid., p. 417.
Hab. China.

**humilis**, id. ibid., p. 418.
Hab. India.

**ventrasa**, id. ibid., p. 656.
Hab. Sumatra, China.

**mediana**, id. ibid., p. 657.
Hab. China.

**xanthomelas**, Fabr., *Anal. Ent.*, p. 49.
Hab. Java.

**nebulo**, Fabr., *Ent. Syst.*, iv, p. 321.
Hab. India.

**rufifrons**, Macq., *Dipt, Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 152.
Hab. Java.

**aucta**, Walker, *Ins. Saunders, Dipt.*, i, *London*, 1856, p. 334.
Hab. India.

**inducta**, id. ibid., p. 335.
Hab. India.

**determinata**, id. ibid., p. 345.
Hab. India.

**cluvia**, id., *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 885.
Hab. India.

**domestica**, Linn., V. d. Wulp, *Sumatra Exped.*, p. 45; Schiner, *Novar. Reise*, 1868.
Hab. Sumatra, Europe (*Cosmopolitan*).

**corvina**, Fabr., V. d. Wulp, ibid., p. 45; Schiner, *Novar. Reise*, 1868.
Hab. Sumatra, Europe (*Cosmopolitan*).

**niveisynamma**, Thomson, *Fregat. Eugenies Resa*, p. 547.
Hab. China, Manilla, Malacca.

**convexifrons**, id. ibid., p. 457.
Hab. China.

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**scapularis**, Rondani, *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1875, p. 428.
Hab. Borneo.

**cutcheniata**, J. Bigot, *Soc. Zool. d. France*, 1887, p. 605.
Hab. Pondicherry, Cochin China.

**cingalesina**, id. ibid., p. 606.
Hab. Ceylon.

## Family ANTHOMYZIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Anthomyzides, Latr., *Reg. Anim.*, 1829; Anthomydæ, Rob. Desv. *Myod.*, 1830, p. 473; Anthomyna, Anthomydæ, Rondani, *Prodr.*, i, 1856, p. 12–24; Anthomynæ, Schiner, *Faun. Austriaca*, 1st Pt., 1862, p. 599.

### Genus ARICIA.

Rob. Desv., *Myod.*, 1830, p. 486; Musca, Anthomyia, Anthomyza, pt. (auctor.) Macrosoma, p. 402, Phaonia, p. 482, Mydina, p. 495, Fellæa, p. 476, Euphemia, p. 485; Trennia, p. 484, Rohrella, p. 489, pt. Rob. Desv., *loc. cit.*, Hydrophoria, p. 297, Spilogaster, p. 293, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835; Yetodesia, pt. Rondani, *Prodr.*, iv, 1861, p. 9; Azelidæ, pt. Rob. Desv., *Myod.*, 1830, p. 591.

**argentata**, Walker, *Journ. Proc. Linn. Soc.*, i, 1857, p. 27.
Hab. Malacca.

**patula**, id. ibid., p. 28.
Hab. Borneo, Singapore.

**inaperta**, id. ibid., 1857, p. 129.
Hab. Borneo.

### Genus HYDROTÆA.

Rob. Desv., *Myod.*, 1830, p. 509; Musca, Anthomyia, Aricia, pt. (auctor.), Blainvillia, pt. Rob. Desv., *loc. cit.*, p. 514; Onodont, pt. Rond., *Prodr.*, i, 1856, p. 94.

**solennis**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 27.
Hab. Mt. Ophir.

**chalcogaster**, Schiner, *Novar. Reise*, 1868, p. 303; Synon. Anthomyia, id., Wiedem., *Ausser. Europ. Zweift. Ins.*, 2nd Pt., *Hamm*, 1830, p. 427.
Hab. Java, Nicobars.

### Genus OPHIRA.

Rob. Desv., *Myod*, 1833, p. 516; Musca, Anthomyia, Aricia, pt. (auctor.).

**congressa**, Walker, *Trans. Ent. Soc., London*, 1857, vol. iv, p. 50.
Hab. India.

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**nigra**, V. d. Wulp., *Sumatra Exped.*, p. 48; Synon. Anthomyia, id. et Gracilis, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 432; Ophira riparia, Dolesch., *Naturk Tijdschr. v. Nederl. Indie, Batavia*, 1858, p. 115.
Hab. China, Sumatra, Amboina.

## Genus Limnophora.

Rob. Desv., *Myod.*, 1830, p. 517; Musca, Anthomyia, Aricia, pt. (auctor.), Helina, p. 493, Limosia, p. 535, Phyllis, p. 603, pt. Rob. Desv., *loc. cit.*

**bengalensis**, id. ibid., p. 518.
Hab. Bengal.

**macei**, id. ibid., p. 519.
Hab. Bengal.

## Genus Diplogaster.

J. Bigot, *Ann. Soc. Ent. France*, 1886.

**nigricauda**, id. ibid.
Hab. Ceylon.

## Genus Anthomyia.

Meig., *Illig. Magaz.*, ii, 1803, p. 281; Chortophila, p. 326, Atomogaster, p. 329, Pegomyia, p. 350, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835: Aricia, Anthomyza, pt. Zetterst., *Dipt. Scandin.*, Egeria, p. 555, Nerina, p. 557, Adia, p. 558, Phorbia, 559, Leucophora, p. 562, Delia, p. 571, Egle, p. 584, Azelia, p. 592, pt. Rob. Desv., *Myod.*, 1830; Achanthiptera, Rondani, *Prodr.*, i, 1856, p. 95.

**trina**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830. p. 657.
Hab. China.

**exigua**, id. ibid., p. 658.
Hab. China.

**bina**, id. ibid., p. 426.
Hab. China.

**quadrata**, id., *Analect. Entom.*, p. 52.
Hab. Java.

**tonitrui**, id. ibid., p. 52.
Hab. India.

**bibax**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 431.
Hab. China.

**calens**, id. ibid., p. 431.
Hab. Sumatra.

**flexa**, id. ibid., p. 434.
Hab. Tranquebar.

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**metallica**, id. ibid., p. 435.
Hab. India.

**illocata**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 129.
Hab. Borneo.

**peroe**, id., *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 939.
Hab. India.

**indica**, id., *Insect. Saunders, Dipter.*, vol. i, *London*, 1856, p. 352.
Hab. India.

**detracta**, id. ibid., p. 356.
Hab. India.

**indicata**, id. ibid., p. 362.
Hab. India.

**aliena**, id. ibid., p. 363.
Hab. India.

**lobalis**, Thomson, *Fregat. Eugenies Resa, Stokholm*, 1858–68, p. 551.
Hab. China.

**lenticeps**, id. ibid., p. 553.
Hab. China.

**bisetosa**, id. ibid., p. 555.
Hab. China.

## Genus Spilogaster.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 293; Musca, Anthomyia, Aricia, Anthomyza, Hylemyia, pt. (auctor.), Hydrophoria, p. 297, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, et Rondani, *Prodr.*, i, 1856, p. 94; Fellæa, p. 476, Mydæ, p. 479, Muscina, p. 406, Rohrella, p. 489, Mydina, p. 495, etc., pt. Rob. Desv., *Myod.*, 1830.

**albiceps**, V. d. Wulp, *Sumatra Exped.*, p. 47.
Hab. Sumatra.

**pruinosus**, J. Bigot, *Ann. Soc. Ent. France*, 1884, p. 287.
Hab. Ceylon.

**leucocerus**, id. ibid., p. 291.
Hab. Indian Archipelago.

## Genus Cœnosia.

Meig., *Syst. Beschr.*, v, 1826, p. 210; Musca, Aricia, Anthomyia, Anthomyza, pt. (auctor.), Schœnomyza, pt. Halid., *Ent. Ent.*, 1833; Limosia, p. 535, Palusia, p. 542, Caricea, pt., p. 530, Rob. Desv., *Myod*, 1830; Chelisia, p. 101, Oplogaster, p. 98, Mycophaga, p. 102, Rondani, *Prodr.*, i, 1856.



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**torrida**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p, 437.
Hab. China.

**macularis**, id., ibid., p. 438.
Hab. India.

**grata**, id. ibid., p. 438.
Hab. China.

**pumila**, id. ibid., p. 439.
Hab. India.

**marginata**, id. ibid., p. 440.
Hab. China.

**loeta**, id. ibid., p. 440.
Hab. India.

**leucospila**, id. ibid., p. 441.
Hab. India.

**pulla**, id. ibid., p. 441.
Hab. Tranquebar.

**modesta**, V. d. Wulp, *Sumatra Exped.*, p. 48.
Hab. Sumatra.

**macularis**, (*nom. bislectum*), Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 559.
Hab. India? China.

**boops**, ib. ibid., p. 559.
Hab. China.

**compressiventris**, id. ibid., p. 559.
Hab. Malacca.

**simplex**, id. ibid., p. 560.
Hab. China, Sumatra.

**falcata**, id. ibid., p. 560.
Hab. China.

**insurgens**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 129.
Hab. Borneo.

## Genus Caricea.

Rob. Desv., *Myod.*, 1830, p. 530; Cœnosia, pt. (auctor.).

**leptosoma**, Rond., *Ann. Mus. Civ. d. Stor. Nat. Genova*, 1875, p. 429.
Hab. Borneo.

## Genus Lispe.

Latr., *Precis d. Caract. Gener.*, 1796, *Gen. Crust. et Ins.*, iv, p. 347; Lispa, Rob. Desv., *Myod.*, 1830, p. 524; Musca, pt. (auctor).

**glabra**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 442.
Hab. India.

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**dilatata**, id. ibid., p. 443.
Hab. India.

**orientalis**, id., *Analect. Entom.*, p. 51.
Hab. India.

**assimilis**, id. ibid., p. 51.
Hab. India.

**vittipennis**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 561.
Hab. China.

**hyalipennis**, id. ibid., p. 562.
Hab. China.

**sinensis**, Schiner, *Novar. Reise*, 1868, p. 296.
Hab. China.

**nicobarensis**, id. ibid., p. 297.
Hab. Nicobars.

**tetrastigma**, id. ibid., p. 297.
Hab. Ceylon.

### Genus Homalomyia.

Bouché, *Naturg. d. Ins.*, i, 1834, p. 88; Musca, Anthomyia, Aricia, pt. (auctor.), Fannia, p. 567, Philinta, 568, Aminta, p. 569, pt. Rob. Desv., *Myod.*, 1830; Myantha, p. 95, Rond., *Prodr.*, i, 1856; Cœlomyia, pt. Halid.

**canicularis**, Schiner, *Novar. Reise*, 1868, p. 298; Synon. Anthomyia id. Meig.
Hab. Nicobars, Europe.

### Family Scatophagidæ.

J. Bigot, *adhuc inedict.*, 1891; Scatomyzides, Fall., *Spec. Entom.*, 1810; Scatomyzidæ, Latr., Macq., *S. à Buff. Dipt.*, 1835; Scatophaginæ, p. 614, Malacosomæ, p. 606, Rob. Desv., *Myod*, 1830; Scatophaginæ, Schiner, *Dipt. Austr. d. Flieg.*, 2nd Pt., 1864, p. 14; Scatophagina, Rond., *Prodr.*, i, 1856, pp. 24, 98.

### Genus Eupteromyia.

J. Bigot, Rev. et *Magas. d. Zool. Guerin*, No. 7, 1859, p. 6.

**trivittata**, id. ibid., p. 6.
Hab. Burma.

## Circulus—**ACALYPTERICTI.**

J. Bigot, *adhuc inedict.*, 1891; Acalyptera, Macq., *S. à Buff.*, ii, *Paris*, 1835, p. 354; Acalypteratæ, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 173.

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## Family HELOMYZIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Helomyzides, Westw., *Introduct.*, 1840; Scatomyzidæ, Latr., pt. Scatomyzides, pt. Fallen; Palomydæ, pt. p. 658, Rob. Desv., *Myod.*, 1830; Helomyzinæ, p. 20, Dryomyzinæ, p. 38, Sciomyzinæ, p. 44, pt. Schiner, *Faun. Austr. d. Flieg.*, 1st Pt., 1864, p. 18; Scatophagina, pp. 24, 98, Sciomyzina, pp. 24, 104, pt. Rondani, *Prodr.*, i, 1856.

### Genus HELOMYZA.

Fallen, *Dipter. Suec.*, 1820; Helomyza, pt. Meig., *System. Beschr.* (et auctor.), Herbina, p. 698, Suillia, p. 642, pt. Rob. Desv., *Myod.*, 1830.

**circumfusa**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 588.
Hab. Sumatra.

**maura**, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 406.
Hab. India.

**intereuns**, id., *Journ. Proc. Linn. Soc., London*, i, 1857, p. 28.
Hab. Mt. Ophir.

**exeuns**, id. ibid., p. 29.
Hab. Mt. Ophir.

**orientalis**, id. ibid., 1857, p. 129; Synon. Sciomyza, id. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 575.
Hab. Java, Borneo.

**fuscicostata**, id. ibid., 1857, p. 129.
Hab. Borneo.

**æquata**, id. ibid., p. 130.
Hab. Borneo.

**limbata**, id. ibid., p. 130.
Hab. Borneo.

**provecta**, id. ibid., p. 130.
Hab. Borneo.

**invicta**, ib. ibid., p. 130.
Hab. Borneo.

### Genus SCIOMYZA.

Fallen, *Dipt. Suec.*, 1820, (auctor.); Colobœa, pt. Zetterst., *Dipt. Scandin.*, Scatophaga, pt. Fabr.; Anticheta, pt. Halid.; Dyctia, p. 692, Pherbellia, p. 695, Chetocera, p. 697, Melina, 695, Arina, 696, pt. Rob. Desv., *Myod.*, 1830.

**repleta**, Walker, *Ins. Saunders. Dipt.*, i, *London*, 1856, p. 399.
Hab. India.

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**terminalis**, id., *Trans. Ent. Soc., London*, 1857-60, p. 31.
Hab. India.

**reticulata**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858-68, p. 570.
Hab. China.

**propinqua**, id. ibid., p. 570.
Hab. China.

## Genus Dryomyza.

Fallen, *Dipter. Suec.*, 1820; Meig. (et auctor.), Dryope, p. 618, pt. Rob. Desv., *Myod.*, 1830.

**maculipennis**, Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 273.
Hab. India.

## Genus Gauzania.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 130.

**devecta**, id. ibid., p. 131.
Hab. Borneo.

## Genus Xarnuta.

Walker, *Journl. Proceed. Linn. Soc.. London*, i, 1857, p. 28.

**leucotelus**, id. ibid., p. 28.
Hab. Singapore.

## Genus Sapromyza.

Fallen, *Dipt. Suec.*, 1820, (et auctor.); Toxonevra, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 404: Lycia, p. 637, Sylvia, p. 636, Herbina, p. 698, Suillia, p. 642, Rob. Desv., *Myod*, 1830; Palloptera, pt. Fallen; Dacus, pt. Fabr.

**conferta**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt, *Hamm*, 1830, p. 454.
Hab. China.

**fallenii**, id. ibid., p. 445.
Hab. India.

**levis**, id. ibid., p. 456.
Hab. China.

**bengalensis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 188.
Hab. Bengal.

**biguttata**, id. ibid., p. 188.
Hab. Java.

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**javana**, id. ibid., *4th Supplt.*, 1850, p. 274.
Hab. Java.

**poecila**, Schiner, *Novar. Reise*, 1868, p. 279.
Hab. Nicobars.

**scutellaris**, V. d. Wulp, *Tijdschr. v. Entom.*, deel xxiii, p. 39.
Hab. Java.

### Genus Minettia.

Rob. Desv., *Myod.*, 1830, p. 646; Sapromyza, pt. (auctor.).

**signata**, V. d. Wulp, *Sumatra Exped.*, p. 52.
Hab. Sumatra.

## Family Psilomydæ.

J. Bigot, *adhuc inedict.*, 1891; Psilomydæ, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 416; Psilinæ, Schiner, *Faun. Austr.*, *D. Flieg.*, 2nd Pt., 1864, p. 196; Psilites, pt. O. Heer, *Ins. Fauna*, ii, 1849; Loxoceridæ, pt. Macq., *S. à Buff. Dipt*, ii, *Paris*, 1835, p. 372; Cordyluridæ, Macq., *loc. cit.*, p. 375; Scatomyzidæ, pt. Latr. Fabr.; Opomyzidæ, pt. Fall., Zett.; Palomydæ, Rob. Desv., *Myod.*, 1830, p. 658; Chilizina, pt. Rondani, *Prodr.*, i, 1856, p. 122.

### Genus Psila.

Meig., *Illig. Magaz.*, ii, 1803, p. 278; Scatophaga, pt. Fall. Zetterst. Psilomyda, pt. Latr. Psilomyia, Macq., *S. à Buff. Dipt.*. ii, *Paris*, 1835, p. 420; Oblicia, p. 620, Rob. Desv., *Myod.*, 1830.

**apicalis**, Wiedem., *Ausser. Europ. Zweifl. Ins.*, 2nd Pt., *Hamm*, 1830, p. 527.
Hab. China.

## Family Tetanoceridæ.

J. Bigot, *adhuc inedict.*, 1891; Dolichocera, pt. Latr., *Reg. Anim.*, 1829; Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 361; Sciomyzidæ, pt. Fall. Tetanocerinæ, Schiner, *Faun. Austr. D. Flieg.*, 2nd Pt., 1864, p. 52; Palomydæ, pt. Rob. Desv., *Myod.*, 1830, p. 658; Sciomyzina, pt. Rond., *Prodr.*, i, 1856, p. 104; Tetanoceridæ, J. Bigot, (*olim*).

### Genus Sepedon.

Latr., *Dict. Hist. Nat.*, vol. 24, 1804, *Gen. Crust. et Ins.*, iv, p. 349; Syrphus, pt., Mulio, pt. Fab., Rossi.

**javanensis**, Rob. Desv., *Myod.*, 1830, p. 677.
Hab. Java, Sumatra.

**ferruginosus**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 577.
Hab. India.

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**plombellus**, id. ibid., p. 577.
Hab. China.

**senescens**, id. ibid., p. 579.
Hab. China.

**crishna**, Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 1079.
Hab. Nepal.

### Genus Tetanocera.

Latr., *Gen. Crustac. et Insect.*, iv, p. 350, 1809; Tetanocerus, Dumeril; Oscinis, pt. Fabr.; Euthycera, pt. Latr.; Dyctia, p. 692, Pherbina, Rob. Desv., *Myod.*, 1830, p. 687.

**discalis**, Walker, *Trans. Ent. Soc. London*, 1857–60, p. 54.
Hab. Burma.

### Family CALOBATIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Leptopodites, Latr., *Cuvier, Regn. Anim.*, 1829; Leptopoditæ, Macq., *Suit à Buff. Dipt.*, ii, *Paris*, 1835, p. 486; Opomyzidæ, pt. Fabr. Thelidomydæ, Rob. Desv., *Myod*, 1830, pp. 704–734; Tanypezinæ, Schiner, *Faun. Austr. d. Flieg.*, 2nd Pt., 1864, p. 190; Tanypezina, Rond., *Prodr.*, i, 1856, pp. 24, 114; Neriades, pt. Westw., *Introd. Modern. Classific. Ins.*, 1840; Sepsidæ, pt. Fallen; Leptapodidæ, Longinidi, pt. J. Bigot, (*olim*).

### Genus Nerius.

Fabr., *Syst. Antl.*, 1805; Neria, Rob. Desv., *Myod.*, 1830, p. 736.

**fuscus**, Wiedem., *Anal. Entom.*, p. 15.
Hab. Java, Sarawak.

**lineolatus**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 552.
Hab. Java.

**duplicatus**, id. ibid., p. 553.
Hab. Java.

**inermis**, Schiner, *Novar. Reise.*, 1868, p. 248.
Hab. Nicobars.

**indica**, Rob. Desv., *Myod.*, 1830, p. 737.
Hab. India.

**fuscipennis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1842, p. 241.
Hab. Java, Mt. Ophir, Singapore.

### Genus Nothybus.

Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 439.

**longithorax**, id. ibid., p. 439.
Hab. Sarawak.

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## Genus Calobata.

Meig., *Illig. Magaz.*, ii, 1803, p. 276; Ceyx, Dumer. Tanipoda, pt. Rondani, *Prodr.*, i, 1856, p. 116.

**leucopeza**, Wiedem., *Anal. Entom.*, p. 41.
Hab. India.

**albitarsis**, id., *Zool. Magaz.*, iii.
Hab. Java.

**vidua**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 540.
Hab. Tranquebar.

**splendens**, id. ibid,, p. 539.
Hab. Ceylon.

**stylophora**, Schiner, *Novar. Reise*, 1868, p. 539.
Hab. Nicobars.

**albimana**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 245,
Hab. Java, Port Jackson, Cuba? Philadelphia?

**basalis**, Walker, *Ins. Saunders. Dipter.*, *London*, 1856, p. 391.
Hab. India.

**contracta**, id. ibid., p. 395.
Hab. India.

**cyanescens**, id., *Trans. Ent. Soc.*, *London*, 1857-60, p. 61.
Hab. Burma.

**prudens**, Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 455.
Hab. Sumatra.

**morbida**, id. ibid., p. 457.
Hab. Java, Sumatra.

**confinis**, Walker, *Journl. Proceed. Linn. Soc.*, *London*, i, 1857, p. 37.
Hab. Singapore, Mt. Ophir.

**immixta**, id. ibid., p. 37.
Hab. Malacca.

**cedens**, id. ibid., 1857, p. 135.
Hab. Borneo.

## Genus Tanipoda.

Rondani, *Prodr.*, i, 1856, p. 116; Calobata, pt.

**strenua**, Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 440; Synon. Calobata, id. Walker, *Journl. Proceed. Linn. Soc.*, *London*, i, 1857, p. 135.
Hab. Sarawak, Borneo.

**caligata**, id. ibid., p. 440.
Hab. Sarawak, Borneo.

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**lutellabris**, id. ibid., p. 441.
Hab. Sarawak, Borneo.

**cubitalis**, id. ibid., p. 441.
Hab. Sarawak, Borneo.

## Genus Macrotoma.

Delaporte, *Ann. Sc. Nat.*, xxv, 1832, p. 457; Longina, pt. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 554; Longina, Macq., *Suit. à Buff. Dipt.*, ii, *Paris*, 1835, p. 493; Diateina, pt. Westw., *Grif. Anim. Kingd.*

**pelleterii**, Delaporte, *loc. cit.*
Hab. Cochin China.

## Genus Tæniaptera.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 491.

**albimana**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, New series 1856, p. 413.
Hab. Djokjokarta.

**cinereipennis**, J. Bigot, *Ann. Soc. Ent. France*, 1886, p. 376.
Hab. Burma.

**amœna**, id. ibid., 1886, p. 376.
Hab. Burma.

## Genus Mimegralla.

Rondani, *Nouv. Ann. d. Scien. Nat. d. Bologna*, 1850, p. 18.

**birmanensis**, J. Bigot, *Ann. Soc. Ent. France*, 1886, p. 382.
Hab. Burma.

## Genus Grammicomyia.

J. Bigot, *Rev. et Magas. d. Zool. Guerin.*, No. 7, *Paris*, 1859, p. 10.

**testacea**, id. ibid., p. 10.
Hab. Ceylon.

## Genus Micropeza.

Meig., *Illig. Magaz.*, ii, 1803, p. 276; Calobata, pt. (auctor.); Phantasma, pt., p. 789, Rob. Desv., *Myod.*, 1830.

**fragilis**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 87.
Hab. Singapore, Mt. Ophir.



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### Genus CARDIACEPHALA.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 242; Nerius, Calobata, pt. (auctor.)

**longicollis**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 135.
Hab. Borneo.

### Genus TEXARA.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 38.

**compressa**, id. ibid., p. 38.
Hab. Singapore.

### Genus CEPHALIA.

Meig., *Syst. Beschr.*, v, 1826, p. 169; Myrmecomya, pt. Rob. Desv., *Myod.*, 1830, p. 721.

**bicolor**, J. Bigot, *Ann. Soc. Ent. France*, 1886, p. 385.
Hab. Ceylon.

## Family SEPSIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Sepsideæ, Macq., *S. à Buff. Dipt*, ii, *Paris*, 1835, p. 475; Ortalidæ, pt. (auctor.), Carpomyzæ, pt. Latr.; Thelidomydæ, pt. Rob. Desv., *Myod.*, 1830, pp. 704, 734; Sepsinæ, Schiner, *Faun. Austr. d. Flieg.*, 2nd Pt., 1864, p. 175; Tanypezinæ, Rond., *Prodr.*, i, 1856, p. 114.

### Genus SEPSIS.

Fallen, *Dipter. Suec.*, 1820; Ortalis, Tephritis, pt. (auctor.); Micropeza, pt. Latr., id. Rob. Desv., p. 740, Rob. Desv., *Myod.*, 1830; Enicita, pt. Westw.; Enicopus, pt. Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 1002; Sepsis, (auctor.).

**trivittata**, J. Bigot, *Ann. Soc. Ent. France*, 1886, p. 388.
Hab. Ceylon.

**indica**, Wiedem., *Analect. Entom.*, p. 57.
Hab. India.

**nitens**, id. ibid., p. 57.
Hab. India.

**lateralis**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 468.
Hab. China.

**complicata**, id. ibid., p. 468.
Hab. China.

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**bicolor**, id. ibid., p. 468.
Hab. China.

**viduata**, Thomson, *Fregat. Engenies Resa, Stockholm*, 1858–68, p. 586.
Hab. China.

**monostigma**, id. ibid., p. 587.
Hab. China.

### Genus Michogaster.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 483; Cephalia, pt. Wiedem.; Polystodes, pt., p. 722, Rob. Desv., *Myod.*, 1830.

**bambusarium**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, New Series 1856, p. 413.
Hab. Djokjokarta.

## Family Diopsidæ.

J. Bigot, *adhuc inedict.*, 1891.

### Genus Diopsis.

Linn. *Id. Dahl. Diss. d. Big. Ins.*, 1838; Diopsidæ, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 234, (et auctor).

**circularis**, Macq. *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 456.
Hab. India, Java, Cape of Good Hope?

**subfasciata**, id., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1835, p. 238.
Hab. Java.

**dalmanni**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 560.
Hab. Java.

**ichneumonea**, Donovan, *Ins. Ind. Rees. Encyclop.*, xi pl. 2; Synon. Sensu Walker, *List. Dipter., Ins. Brit. Mus.*, iv, *London*, 1849, p. 1060; D. indica, Westw. *Linn. Trans.* xvii, p. 299.
Hab. Java, India.

**westwoodii**, (Dehann), Westw., *Cabinet. Orient. Entom., London*, 1848, p. 37.
Hab. India.

**quinqueguttata**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 36.
Hab. Malacca.

**discrepans**, id. ibid., 1857, p. 134.
Hab. Borneo.

**attenuata**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, New Series 1856, p. 413; Synon. Sensu Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 490; D. latimana, Rondani, *Ann. Mus. Civ. Genova*, vii, p. 444, et D. lativola, Rond., ibid., p. 445.
Hab. Java, Borneo, Sarawak.

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**apicalis**, id. ibid., p. 413; Synon. D. graminicola, id. ibid,, 1857, p. 417.
Hab. Java.

**dubia**, J. Bigot, *Ann. Soc. Ent. France*, 1874, p. 111.
Hab. Borneo.

**belzebuth**, id. ibid., p. 113.
Hab. Borneo.

**villosa**, id. ibid., p. 114.
Hab. Borneo.

### Genus TELEOPSIS.

Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, pp. 442–43; Diopsis, pt. (auctor).

**sykesii**, Rondani, id. ibid., p. 443; Synon. Diopsis, id. Gray, Westw., *Linn. Trans.*, xvii, p. 310.
Hab. India, Sarawak.

**breviscopium**, Rond., ibid., p. 443.
Hab. Sarawak.

**longiscopium**, id. ibid., p. 444.
Hab. Sarawak.

**fulviventris**, J. Bigot, *Ann, Soc. Ent. France*, 1880, p. 94.
Hab. India.

### Genus SPHYRACEPHALA.

Westwood, *Cabinet of Orient. Entomol., London*, 1848, p. 37.

**hearseiana**, id. ibid., p. 37.
Hab. India,

## Family **TRYPETIDÆ**.

J. Bigot, *adhuc inedict.*, 1891; Carpomyzæ, Ortalideæ, Tephritidæ, pt. Fallen, (et auctor.), Myodinæ, Rob. Desv., *Myod.*, p. 704, et Aciphoreæ, ibid., 1830, p. 748; Ortaloidi et Ortalidinæ, pt., p. 6, Tephritoidi, pt., p. 5, Rondani, *Dipt. Ital. Prod. Part, VII, Bullet. d. Soc. Entom. Italiana*, vol. i, Fasc., 1 et 2, 1869, et vol. iii, Fasc., 2, 1871; Ortalinæ et Trypetinæ, Schiner, *Faun. Austriaca D. Flieg.*, 2nd Pt., pp. 8 et 9, 1864.

### Division ORTALIDA.

J. Bigot, *adhuc inedict.*, 1891; Ortalideæ, Fallen, 1810, Macq. Dipt. ti, 1835, p. 429; Carpomyzæ, pt. Latr., *Reg. Anim.*, Myodinæ, p. 704 et Aciphoreæ, pt., p. 748, Rob. Desv., *Myod.*, 1830; Ortaloidi et Ortalidinæ, pt. Rondani, p. 5, *Dipter. Ital. Prodr.*, vii, Fasc., 3, 1869; Ortalinæ, pt. Schiner, *Faun. Austr. d. Flieg.*, 1864, p. 8.

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## Genus Bactrocera.

Guerin, *Voy. de la Coquille, Dpt.*, 1830, p. 300; Dacus, pt. (auctor.).

**fasciatipennis**, (Bactrocera), Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, New Series, 1856, p. 412.
Hab. Java.

**maculipennis**, (Bacterocera), id. ibid., p. 412.
Hab. Java.

## Genus Dacus.

Fabr., *Syst. Antl.*, Meig., *Syst. Beschr.* vi, 1830, p. 21; Oscinis, pt. Latr. Brachyopa, pt. Meig., *Syst. Beschr.*, iii, *Hamm*, 1822, p. 262.

**ferrugineus** (Musca id. Fabr., *Ent. Syst.*, iv); Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 515.
Hab. India, Java.

**umbrosus**, Fabr., *Syst. Antl.*, p. 274.
Hab. Sumatra.

**fascipennis**, Wiedem., *Zool. Magaz.*, iii, p. 28.
Hab. Java.

**klugii**, id., *Anal. Entom.*, 1869, p. 56.
Hab. India.

**longicornis**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 524.
Hab. Java.

**limbipennis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 217.
Hab. Java.

**ritsemæ**, Weyenberg, *Archiv. Neerland.*, iv.
Hab. Java.

**incisus**, Walker, *Trans. Ent. Soc., London*, 1857-60, p. 56.
Hab. Burma.

**squalidus**, id. ibid., p. 56.
Hab. India.

**cylindricus**, V. d. Wulp, *Tijschr. v. Entom*, deel xxiii, 1880, p. 29.
Hab. Java.

## Genus Hebina.

Rob. Desv., *Myod.*, 1830, p. 724; Musca, Tephritis, pt. Fabr.; Ortalis, pt. Meig.

**calcarata**, Macq., *Dipt. Exot.*, i, 3rd Pt., *Paris*, 1843, p. 207.
Hab. India.

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**cyaneiventris**, V. d. Wulp, *Sumatra Exped.*, p. 51.
Hab. Sumatra.

## Genus Senopterina.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 454; Dacus, pt. (auctor.).

**senea**, V. d. Wulp, *Sumatra Exped.*, p. 50; Synon. Dacus, id. Wiedem., *Zool. Magaz.*, iii, p. 29; Senopterina labialis, Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 430.
Hab. Java, Sumatra, Sarawak.

**batavensis**, Schiner, *Novar. Reise*, 1868, p. 288.
Hab. Batavia.

**flavipes**, id. ibid., p. 288.
Hab. Singapore.

**zonalis**, Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 430.
Hab. Sarawak.

**marginata**, V. d. Wulp, *Tijdschr. v. Entom.*, 1879-80, p. 27.
Hab.

## Genus Eurypalpus.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 443.

**testaceus**, id. ibid., p. 443.
Hab. Java.

## Genus Loxonevra.

Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 446; Platystoma, pt. (auctor.).

**decora**, id. ibid., Synon. Dyctia, id. Fabr., *Syst. Antl.*, Platystoma, id. Wiedem., *Ausser, Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 568.
Hab. Java.

## Genus Campylocera.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 220.

**myopina**, V. d. Wulp, *Tijdschr. v. Entom.*, deel xxiii, 1879-80, p. 37.
Hab. Java.

**robusta**, id. ibid., p. 38.
Hab. Java.

## Genus Oxycephala.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 197.

**pictipennis**, Walker, *List. Dipt. Ins. Brit. Mus.*, *London*, 1849, addenda, p. 1162.
Hab. India.

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### Genus Lamprogaster.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 211; Chromatomyia, Walker, *List. Dipt. Ins. Brit. Museum*, iv, *London*, 1849, p. 801; Scholastes, Guerin, *Voy. Coquille, Zool.*, p. 299.

**flavipennis**, id ibid., p. 211; Zigemula, pt. Sensu Walker; Pterogenia, pt. J. Bigot.
Hab. Indian Archipelago.

**frauenfeldi**, Schiner, *Novar. Reise.*, 1868, p. 285.
Hab. Batavia.

**sonata**, Walker, *Journl. Proceed. Linn. Soc.*, i, 1857, p. 30.
Hab. Singapore.

**glabra**, id. ibid., p. 30.
Hab Singapore.

**transversa**, id. ibid., p. 30.
Hab. Malacca.

**vittata**, id. ibid., p. 31.
Hab. Singapore.

**truncatala**, id. ibid., p. 31.
Hab. Singapore.

**basilutea**, id. ibid., 1857, p. 131.
Hab. Borneo.

**divisa**, id. ibid., p. 131.
Hab. Borneo.

**punctata**, id. ibid., p. 132.
Hab. Borneo.

**guttata**, id. ibid., pp. 31, 132.
Hab. Singapore, Borneo.

### Genus Prosyrogaster.

(Adapsilidi?) Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 438.

**chelyonothus**, id. ibid., p. 438.
Hab. Sarawak, Borneo.

### Genus Zygænula.

Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1858, p. 117; Pterogenia, J. Bigot, *Rev. et Mag. d. Zool. Guerin*, 1859, p. 309.

### Genus Pterogenia.

J. Bigot, *Rev. et Magas. d. Zoolog. Guerin*, No. 7, *Paris*, 1859, p. 8.

**dayak**, id. ibid., p. 9.
Hab. Sarawak.

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## Genus Platystoma.

Meig., *Ilig. Magaz.*, ii, 1803, p. 277; Dyctia, pt. (auctor), Trupanea, pt., Schrank, Hesyquillia, p. 708, Palpomyia, p.7 08, pt. Rob. Desv., *Myod.*, 1830; Megaglossa, Rond., *Bullet. d. Soc. Ent. Italiana*, 1869, *Prodr.*, vii, p. 32; Hemigaster, p. 431, Elachigaster, p. 432, Ditomogaster, p. 433, pt. Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875.

**albovittatus**, (Hemigaster), Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 431.
Hab. Borneo.

**albitarsis**, (Elachigaster), id. ibid., p. 432.
Hab. Borneo.

**xanthomera**, (Ditomogaster), id. ibid., p. 433.
Hab. Borneo.

**orientalis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1842, p. 200.
Hab. India.

**irrorata**, Thomson, *Fregat. Eugines Reise, Stockholm*, 1858–68, p. 577.
Hab. Indian Archipelago, Malacca.

**punctiplena**, Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 471, id. Walker, *Journl. Proceed. Linn. Soc., London*, 1861, p. 268; Synon. Stellata, *loc. cit.*, 1856, p. 32; Atomaria, id. ibid., 1859, p. 148, Parvula Schiner, *Novar. Reise*, 1868, p. 286.
Hab. Batavia, Celebes.

**superba**, V. d. Wulp, *Sumatra Exped.*, p. 50.
Hab. Sumatra.

**rigida**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 32.
Hab. Singapore.

## Genus Eniconevra.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 203,

**fenestralis**, id. ibid., p. 204.
Hab. India; West Africa.?

## Genus Ortalis.

Fallen, *Dipter. Suec.* 1820? Dyctia, Scatophaga, Tephritis, Otites, pt. Latr. *Reg. Anim.*, Oscinis, pt. Latr., Blainvillia, p. 514, Myennis, p. 717 Myodina, 727, pt. Heramya, pt., p. 709, Rob. Desv., *Myod.*, 1830.

**isara**, Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 994.
Hab. India.

**rutilans**, (Boisduvalia), Rob. Desv., Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 437.
Hab. India.

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## Genus Dasyneura.

Saunders, *Trans. Ent. Soc.*, iii, *London*, 1841, p. 60; Dacus, pt. (auctor.).

**caudata**, Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 1073; Synon. Dacus, id. Fabr., *Syst. Antl.*, p. 276.
Hab. Java, N. Bengal.

**tau**, id. ibid., p, 1074.
Hab. China.

**zonata**, id. ibid., p. 1075.
Hab. Bengal.

## Genus Themara.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 33; Acanthoneura, pt. Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 220; Achias, pt. Westw.

**maculipennis**, Ost.-Sack., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 460; Synon. Achantoneura, (Macq.), id. Westw., *Cabin. Orient. Entom., London*, 1858, p. 38; Achias horsfeldi, Westw., *Trans. Ent. Soc. London*, 1850; Themara ampla, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 33.
Hab. Singapore.

**hirtipes**, Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 435.
Hab. Sarawak.

**ypsilon**, id. ibid., p. 435.
Hab. Sarawak.

## Genus Xiria.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 36.

**antica**, id. ibid., p. 36.
Hab. Mt. Ophir.

**obliqua**, Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 463.
Hab. Sumatra.

## Genus Rhadinomyia.

Schiner, *Novar. Reise*, 1868, p. 290.

**orientalis**, id. ibid., p. 290.
Hab. Java, Batavia.

## Genus Rivellia.

Rob. Desv., *Myod.*, 1830, p, 729; Tephritis, pt. Latr.; Fabr. Ortalis, pt. (auctor.).

**persica**, J. Bigot, *Indian Economic Entomol.*, i, 1890, p. 192.
Hab. India.



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## Genus Ceratitis.

Macleay, *Zool. Journl.*, iv, p. 475; Petalophora, Macq., *S. d Buff. Dipt.*, ii, *Paris*, 1835, p. 454; Trypeta, pt. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 496, (Tryp. capitata).

**capitata**, (Trypeta id.), Wiedem, *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 496, C. citriperda Macleay, *l. c.*, p. 475.
Hab. India.

## Genus Adrama.

Walker, *Journl. Proceed. Linn. Soc., London*, 1858, p. 117; Synon. Sensu Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 479; Acanhipeza, Rondani, *Ann. id.*, iii, 1875, p. 437.

**selecta**, id. ibid., p. 117; Synon. Sensu Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1381, p. 479; Enicoptera rufiventris, Walker, *Journl. Proceed. Linn. Soc., London*, 1860, p. 163, Psila cruciata, id. ibid., iii, p. 123; Acanthipeza maculifrons, Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 438.
Hab. Borneo, Amboina, New Guinea, Wokan.

## Genus Charax.

Walker, *Trans. Ent. Soc., London*, 1857–60, p. 58.

**planidorsum**, id. ibid., p. 58.
Hab. Burma.

## Genus Rioxa.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 35.

**lanceolata**, id. ibid., p. 35.
Hab. Singapore, Borneo.

**confinis**, id. ibid., 1856, p. 132.
Hab. Borneo.

**erebus**, Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 436.
Hab. Sarawak.

**nox**, id. ibid., p. 437.
Hab. Sarawak.

## Genus Sophira.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 34.

**concinna**, id. ibid., p. 132.
Hab. Borneo.

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**venusta**, id. ibid., 1857, p. 35.
Hab. Singapore.

### Genus Nœeta.

Rob. Desv., *Myod.*, 1830, p. 778.

**latiuscula**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 133.
Hab. Borneo.

### Genus Strumeta.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857. p. 33.

**conformis**, id. ibid., p. 34.
Hab. Singapore.

### Genus Valonia.

Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 34.

**complicata**, id. ibid., p. 34.
Hab. Malacca.

### Genus Oxyphora.

Rob. Desv., *Myod.*, 1830, p. 757.

**malaica**, Schiner, *Novar. Reise.*, 1868, p. 274.
Hab. Ceylon.

### Genus Chelyphora.

Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1875, p. 433.

**borneana**, id. ibid., p. 434.
Hab. Sarawak.

### Genus Agastrodes.

J. Bigot, *Rev. et Magaz. d. Zool., Guérin*, No. 7, *Paris*, 1859, p. 7.

**niveitarsis**, id. ibid., p. 8.
Hab. Ceylon.

## Division TRYPETIDA.

J. Bigot, *adhuc inedict.*, 1891; Carpomyzæ, pt. Latr., *Regn. Anim.*; Ortalidæ, pt. Fallen; Tephritidæ, pt. Macq., *Suit. à Buff. Dipt.*, ii, *Paris*, 1835, p. 447; Aciphoreæ, pt., p. 748, Rob. Desv., *Myod.*, 1830; Trypetinæ, Schiner, *Faun. Austriaca, d. Flieg.*, 2nd Pt., ix, 1864; Ortalidina, pt. Rond., *Prodr.*, i, 1856, p. 108.

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## Genus Trypeta.

Meigen, *Ilig. Magaz.*, ii, p. 1803; Scatophaga, Dacus, pt. Fabr.; Trupanea, pt. Schrank; Tephritis, pt. (auctor), Sitarea, p. 763, Terellia, p. 758, pt., Rob. Desv., *Myod.*, 1830; Carpomyia, p. 111, Cerajocera, p. 111, pt., Rond., *Prodr.*, i, 1856.

**atilia**, Walker, *List. Dipt. Ins. Brit. Museum*, iv, *London*, 1849, p. 1021; Synon. Trypeta melaleuca? Walker, *Journl. Proceed. Linn. Soc., London*, 1864, p. 238; Sensu Osten.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 459.
Hab. China, Ceram, Celebes.

**sinica**, id., *Trans. Ent. Soc., London*, 1857–60, p. 41.
Hab. China.

**tubifera**, id. ibid., p. 42.
Hab. China.

**rudis**, id., *Journ. Proc. Linn. Soc.*, i, 1857, p. 133.
Hab. Borneo.

**crux**, (Musca, Dacus), Fabr. *Encycl. Syst.*, iv, p. 358, et *Syst. Antl.*, p. 277.
Hab. India.

**violacea**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 476.
Hab. Java.

**vaga**, id. ibid., p. 490.
Hab. Bengal.

**modesta**, id. ibid., p. 493; Synon. Dacus, id. Fabr., *Syst. Antl.*, p. 278; Sensu Wiedem., *loc. cit.*
Hab. Bengal.

**obsoleta**, id. ibid., p. 499.
Hab. Java.

**incisa**, id., *Anal. Entom.*, p. 53.
Hab. Bengal.

**acrostacta**, id. ibid., p. 54.
Hab. India.

**fessata**, *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 503; Synon. Tephitis, id. Fabr., *Syst. Antl.*, p. 320; Sensu Wiedem., *loc. cit.*
Hab. Tranquebar.

**reinhardti**, id., *Anal. Entom.*, p. 54.
Hab. India.

**basilaris**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 510.
Hab. Sumatra.

**tucia**, Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 1021.
Hab. Bengal.

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**stella**, id. ibid., p. 1030.
Hab. Bengal.

**antiqua**, id., *Insect. Saunders. Dipter.*, vol. i, *London*, 1856, p. 378.
Hab. India.

**cylindrica**, id. ibid., p. 380.
Hab. India.

**mixta**, id. ibid., p. 385.
Hab. India.

**contraria**, id. ibid., p. 385.
Hab. India.

**ferruginea**, id. ibid., p. 387.
Hab. India.

**incisa**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 579, (*nom. bislect.?*).
Hab. China.

**sinensis**, id. ibid., p. 585.
Hab. China.

## Genus Euleia.

Walker, *Ent. Magaz.*, iii, p. 81; Trypeta, pt.

**mutica**, (Trypeta) id., *List. Dipt. Ins. Brit. Museum*, iv, *London*, 1849, p. 1036.
Hab. India.

## Genus Vidalia.

Rob. Desv., *Myod.*, 1830, p. 719.

**impressifrons**, id. ibid., p. 719.
Hab. India.

## Genus Stylophora.

Rob. Desv., *Myod.*, 1830, p. 723.

**sonata**, id. ibid., p. 723.
Hab. Coromandel.

## Genus Boisduvalia.

Rob. Desv., *Myod.*, 1830, p. 730.

**rutilans**, id. ibid., p. 730.
Hab. India.

## Genus Acanthonevra.

Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 220.

**fuscipennis**, id. ibid., p. 221.
Hab. Bengal.

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## Genus Urophora.

Rob. Desv., *Myod.*, 1830, p. 769; Dacus, pt. Fabr.; Trupanea, pt. Schrank; Scatophaga, pt. Germar; Tephritis, pt. (auctor.); Trypeta, pt. (auctor.).

**tæniata**, Macq., *Dipt. Exot.*, ii, 3rd Pt, *Paris*, 1843, p. 222.
Hab. Java.

**vittithorax**, id. ibid., *4th Supplt.*, *Paris*, 1850, p. 286.
Hab. India.

**fasciata**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 134.
Hab. Borneo.

## Genus Tephritis.

Latr., *Dict. Hist. Nat.*, vol. 24, 1804; Dacus, Tephritis, pt. Fabr.; Trupanea, pt. Schrank; Trypeta, pt. Meig. Loew.; Acinia, pt. Macq., *S. à Buff.*, ii, *Paris*, 1835, p. 469; Walker, *List. Dipt. Brit. Mus.*, p. 1024 Sphenella, p. 773, Oxyna, p. 755, Urellia, p. 774, Rob. Desv., *Myod.*, 1830.

**fasciventris**, (*nom. bislectum*), Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, p. 225.
Hab. India.

**fasciventris**, (*nom. bislectum*), id. ibid., *Suit. du 2nd Supplt.*, *Paris*, 1847, p. 65.
Hab. Java.

**paritii**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, New series, 1856, p. 412.
Hab. Djokjokarta.

**asteria**, Schiner, *Novar. Reise*, 1868, p. 270.
Hab. Madras.

**brahma**, id. ibid., p. 272.
Hab. Madras.

## Genus Ensina.

Rob. Desv., *Myod.*, 1830, p. 751; Tephritis, pt. Fall., Zetterst.; Trypeta, pt. Meig., Loew.

**guttata**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 230.
Hab. India.

**reticulata**, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, New Series, 1856, p. 412.
Hab. Djokjokarta.

## Genus Scholastes.

Loew, *Monograph Dip. v. N. America*, iii, *Washington*, 1873, p. 38; Platystoma, pt. Guérin; Acinia, pt. Dolesch.; Lamprogastor, pt. (auctor.).

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**cinctus**, Ost.-Sacken, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1881, p. 479; Synon. Platystoma, id. Guérin, *Voy. d. l. Coquille, Zool.*, p. 299; Acinia, faciestriata, Dolesch., *Naturk. Tijdschr. v. Nederl. Indie, Batavia*, 1857, p. 416; Lamprogaster transversa, Walker, *Journl. Proceed. Linn. Soc., London*; 1857, p. 30; id. marginifera, id. *loc. cit.*, 1858, p. 111; Lamprogaster sexvittata, id. *loc. cit.*, 1861, p. 261.
Hab. Malacca, Port-Jackson, Amboina, Arou, New Guinea, Celebes, Batchian, Stuart. Is.

## Genus Acidia.

Rob. Desv., *Myod.*, 1830, p. 720; Scatophaga, pt. Fabr.; Tephritis, pt. Fall., Wied., Zetterst.; Trypeta, pt. Wiedem., Meig., Loew; Urophora, pt. (auctor.), Aciura, pt. Rob. Desv., *Myod.*, 1830, p. 773; Euleia, pt. Walker, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 1036; Epidesmia, p. 112, Myoleja, p. 112, Rond., *Prodr.*, i, 1856.

**quadrincisa**, Schiner, *Novar. Reise*, 1868, p. 264; Synon. Trypeta, id. Wiedem., *Anal. Entom.*, p. 55.
Hab. India, Nicobars.

**soror**, id. ibid., p. 264.
Hab. Batavia.

## Genus Ptilona.

V. d. Wulp, *Tijdchr. v. Entom.*, deel xxiii, 1880, p. 31.

**brevicornis**, id. ibid., p. 33.
Hab. Java.

**dunlopi**, id. ibid., p. 34.
Hab. Padang.

**notabilis**, id. ibid., p. 35.
Hab. Padang.

**sexmaculata**, id., *Sumatra Exped.*, p. 51.
Hab. Sumatra.

## Genus Sphenella.

Rob. Desv., *Myod.*, 1830, p. 773.

**sinensis**, Schiner, *Novar. Reise*, 1868, p. 267.
Hab. Shanghai.

**indica**, id. ibid., p. 267.
Hab. Madras.

## Family Ulidiæ.

J. Bigot, *adhuc inedict.*, 1891; Ulidini, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 498; Ulidinæ, Schin., *Faun. Austriac. d. Fliegen*, ii, 1864, p.

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1864; Tanipezina, pt. Rond, *Prodr.*, i, 1856, p. 114; Ulidina, Loew, *Monogr. N. American, Dipter.*, 3rd Pt., *Washington*, 1873, p. 64; Lauxanidæ, pt, Macq., *S. a Buff. Dipt.*, ii, *Paris*, 1835, p. 506.

## Genus Ulidia.

Meig., *Syst. Beschr.*, v, 1826, p. 385, (et auctor.); Timia, pt. Rond., *Prodr.*, i, 1856, p. 115; Mosillus, pt. Latr.; Chrysomyza, pt. Fallen; Tephritis, pt. Fabr.; Chloria, pt. Schiner, *Faun. Austriac. Diptera*, ii, 1864, p. 85.

**ænea**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 566.
Hab. India.

**divergens**, Walker, *Ins. Saunders, Dipt.*, i, *London*, 1856, p. 397.
Hab. India.

**melanophila**, id, *List. Dipt. Ins. Brit. Mus.*, iv, *London*, 1849, p. 1058.
Hab. Bengal.

**fulviceps**, id., *Trans. Ent. Soc., London*, 1857-60, p. 39.
Hab, India.

## Genus Chloria.

Schiner, *Wien. Entom. Monatschr.*, vi, 1862, p. 151; Ulidia, Tephritis, Chrysomyza, pt. (auctor.).

**clausa**, V. d. Wulp, *Tijdschr. v. Entom.*, deel, xxiii, 1880, p. 28; Synon. Ulidia, id. Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 251.
Hab. Java.

## Genus Celyphus.

Dalman *Vet. Acad. Handl.*, 1818, (et auctor.).

**obtectus**, id., *Anal. Ent.*, p. 32.
Hab. India, Java, Cochin China, Malacca, Phillipp. Is.

**scutatus**, Wiedem., *Ausser, Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830. p. 601.
Hab. India, Java.

**fuscipes**, Macq., *Dipt. Exot., 4th Supplt., Paris*, 1850, p. 301.
Hab. India.

**levis**, V. d. Wulp, *Sumatra Exped.*, p. 53.
Hab. Sumatra.

## Genus Paracelyphus.

J. Bigot, *Rev. et Magas. Zool. Guérin*, No. 7, 1859, p. 10; Celyphus, pt.

**hyacinthus**, id. ibid.
Hab. Malacca, Cochin China.

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## Family SAPROMYZIDÆ.

J. Bigot, *adhuc inedict.*, 1891; Sapromyzides, Fall., *Disc.*, 1820; Scatomyzides, Scyomyzides, pt. (auctor.); Sapromyzinæ, Schiner, *Faun. Austricaa Dipt.*, ii, 1864, p. 88.

### Genus CŒLOPA.

Meig., *Syst. Beschr.*, vi, 1830, p. 194; Copromyza, pt. Fall.; Fucomyia, pt. Halid, *Ann. Nat. Hist.*, ii, p. 186.

**orientalis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 266.
Hab. Java.

### Genus LAUXANIA.

Latr., *Dict. Hist. Nat.*, v. 24, 1804; *Gen. Crust. et Ins.*, iv, p. 291; Dolichopus, Sargus, pt. Fabr.; Calliope, pt. Halid.

**diadema**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, ii, *Hamm*, 1830, p. 661.
Hab. Sumatra.

**rufiventris**, Macq., *Dipt. Exot., Suit. du 2nd Supplt., Paris*, 1847, p. 68.
Hab. Java.

**nigropunctata**, Thomson, *Fregat. Eugenies Resa*, 1858–68, p. 566.
Hab. Guam.

**curvinevris**, id. ibid., p. 567.
Hab. China.

**eucera**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 29.
Hab. Singapore, Borneo.

**detereuns**, id. ibid., p. 29.
Hab. Mt. Ophir.

## Family CHYLISIDÆ.

J. Bigot, *adhuc ined.*, 1891; Chylizina, Rond., *Prodr.*, i, 1856, pp. 25, 122; Psilomydæ, p. 416, Loxoceridæ, p. 372, Cordyluridæ, p. 375, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835; Psilides, pt. Walker; Palomydæ, Rob. Desv., pt. *Myod.*, 1830, p. 658; Psilinæ, Schin., *Faun. Austriaca die Flieg.*, 2nd Pt., 1864, p. 196.

### Genus CHYLIZA.

Fall., *Dipt. Suec.*, 1860; Dasyna, pt. Rob. Desv., *Myod.*, 1830, p. 667; Megachetum, pt. Rond., *Prodr.*, i, 1856, p. 128.

**histrionica**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 530.
Hab. India.



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**calida**, id. ibid., p. 532.
Hab. Sumatra.

**macularis**, id. ibid., p. 531.
Hab. Java.

## Family EPHDRINIDÆ.

J. Bigot, *adhuc ined.*, 1891; Ephydrinidæ, Zetterst., *Dipt. Scandin.*, 1842; Ephidrina, Rond., *Prodr.*, i, 1856, p. 129; Hydromyzidæ, pt. Fall. (et auctor.); Hydrellideæ, p. 783, pt. Rob. Desv., *Myod.*, 1830; Piophilidæ, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 531; Paralimna, pt. Loew, *Öfvers. Vetensk. Akad. Förhandl.*, xix, 1862, p. 3.

### Genus NOTIPHILA.

Fallen, *Dipter. Suec.*, 1823; Keratocera, pt. Rob. Desv., *Myod.*, 1830, p. 788.

**fasciata**, Wiedem., *Anal. Entom.*, p. 57.
Hab. India.

**albiventris**, id. ibid., p. 589.
Hab. India.

**dorsopunctata**, id. ibid., p. 591.
Hab. India.

**indica**, id. ibid., p. 591.
Hab. India.

**peregrina**, id., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 592.
Hab. China.

**chinensis**, id. ibid., p. 592.
Hab. China.

**immaculata**, id. ibid., p. 592.
Hab. China.

**sinensis**, (Paralimna? Loew), Schiner, *Novar. Reise*, 1868, p. 241.
Hab. Hong-Kong.

**ciliata**, V. d. Wulp, *Sumatra Exped.*, p. 55.
Hab. Sumatra.

**radiatula**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 595.
Hab. China.

### Genus DRYXO.

Rob. Desv., *Myod.*, 1830, p. 787.

**lispoidea**, id. ibid., p. 787.
Hab. Sumatra.

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### Genus Discomyza.

Meig., *Syst. Beschr.*, vi, 1830, p. 205; Psilopa, pt. Fallen.

**pelagica**, Schiner, *Verhandl. K. K. z. b. Gesellsch. Wien.*, xi, p. 451.
Hab. Nicobars.

**punctipennis**, V. d. Wulp, *Sumatra Exped.*, p. 56.
Hab. Sumatra.

### Genus Ochthera.

Latr., *Hist. Nat. d. Ins.*, vol. 3, 1802; *Gen. Crust. et Ins.*, iv, p. 347; Macrochira, pt. Zetterst., *Ins. Lapon*, 1840.

**rotundata**, Schin. *Novar. Reise*, 1868, p. 243.
Hab. Nicobars.

### Genus Gymnopa.

Fallen, *Dist.*, 1820, (et auctor); Eristalis, pt. Fabr.

**gutticosta**, Walker, *Journl. Proceed. Linn. Soc., London*, i, 1857, p. 136.
Hab. Borneo.

**infusa**, id. ibid., p. 136.
Hab. Borneo.

## Family Drosophilidæ.

J. Bigot, *adhuc inedict.*; Geomyzides, pt. Fall., 1823; Piophilidæ, pt. Macq., *S. d Buff. Dipt.*, ii, *Paris*, 1835, p. 531; Drosophilina, pt. Rond., *Prodr.*, i, 1856, p. 133; Geomyzinæ, p. 281, Drosophilinæ, p. 269, Borborinæ, pt., p. 319, Schiner, *Faun. Austriaca D. Flieg.*, ii, 1864; Trineuræ, Meig., *Illig. Magaz.*, ii, 1803, p. 276.

### Genus Drosophila.

Fallen, *Dipt. Suec.*, (Geomyzid., pt. *l. c.*, iv, 1823), Camilla, Halid., *Curt. Guide*, 1838; Scaptomyza, pt. Hard.

**nigriventris**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1843, p. 259.
Hab. Cochin China.

**insulana**, Schiner, *Novar. Reise*, 1868, p. 240.
Hab. Nicobars.

**lineata**, V. d. Wulp, *Sumatra Exped.*, p. 57.
Hab. Sumatra.

### Genus Borborus.

Meig., *Illig. Magaz.*, ii, 1803, p. 276; Copromyza, pt. Fallen, (et anctor.); Sphærocera, pt., p. 807, Nerea, p. 802, Mycetia, p. 805, pt. Rob. Desv.,

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*Myod.*, 1830; Crumomyia, p. 569, Apterina, p. 573, Olina, p. 571, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835; Copromyza, p. 124, Apterina, p. 125, pt. Rond., *Prodr.*, i, 1856.

**punctipennis**, Wiedem., *Anal. Entom.*, p. 59.
Hab. India.

### Genus Trineura.

Meig., *Illig. Magaz.*, ii, 1803, p. 276; Tephritis, pt. Fabr.; Phora, pt (auctor.); Philodendria, pt. Rond., *Prodr.*, i, 1856, p. 136.

**peregrina**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 600.
Hab. Canton.

### Genus Clasiopa.

Stenhammar, *Monogr. d. Ephydri*, 1844, p. 251; Notiphila, pt. (auctor.); Discocerina, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 527.

**albitarsis**, V. d. Wulp, *Sumatra Exped*, p. 56.
Hab. Sumatra.

### Genus Geomyza.

Fallen, *Dipter. Suec.*, 1823; Tephritis, pt. Fabr.; Opomyza, pt. Meig.

**laticosta**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 598.
Hab. Malacca.

**spuria**, id. ibid., p. 599.
Hab. China.

## Family Chloropidæ.

J. Bigot, *adhuc inedict.*, 1891; Heteromyzides, Oscinides, pt. Fallen, 1820; Agromyzides, pt. id., *Diss.*, 1823; Chloropinæ, p. 207, Agromyzinæ, p. 209, Borborinæ, p. 319, pt. Schiner, *Faun. Austriaca d. Flieg.*, 2nd Pt., 1864; Heteromyzidæ, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 574; Agromyzina, pp. 25, 120, Chilizina, pp. 25, 122, Capromyzinæ, pp. 25, 123, Chloropina, pp. 26, 125, Oscinina, pp. 26, 127, Ephidrina, pp. 26, 129; Asthenina, pp. 39, 190, pt. Rond., *Prodr.*, i, 1856.

### Genus Chlorops.

Meig., *Illig. Magaz.*, ii, 1803, p. 278; Oscinis, pt. Fallen (et auctor.); Tepritis, pt. Fabr.

**extraneus**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 596.
Hab. China.

**stiolatus**, id. ibid., p. 597.
Hab. China.

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**confusus**, id. ibid., p. 597.
Hab. China.

**longicornis**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 604.
Hab. China.

**nicobarensis**, Schiner, *Reise Fregat. Novara*, 1868, p. 245.
Hab. Nicobars.

### Genus Cerais.

V. d. Wulp, *Sumatra Exped.*, p. 54.

**magnicornis**, id. ibid., p. 55.
Hab. Sumatra.

### Genus Oscinis.

Latr., *Diction.*, vol. 24, 1804; *Gen. Crust. et Ins.*, iv, p. 351; Chlorops, pt. Meig.

**insignis**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 605.
Hab. China.

**ensifera**, id. ibid., p. 605.
Hab. China.

### Genus Heteromyza.

Fallen, *Dipt. Suec.*, 1820; Helomyza, pt. Meig.; Lentiphora, pt., p. 656, Rob. Desv., *Myod.*, 1830; Heterostoma, pt. Rond., *Prodr.*, i, 1856, p. 104.

**orientalis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1835, p. 262.
Hab. Java.

### Genus Cœlopa.

Meig., *Syst. Beschr.*, vi, 1830, p. 194; Copromyza, pt. Fall.; Fucomyia, pt. Halid, *Westw. Modern Classif. of Ins.*, 1840.

**orientalis**, Macq., *Dipt. Exot.*, ii, 3rd Pt., *Paris*, 1835, p. 266.
Hab. Java.

### Genus Homalura.

Meig., *Syst. Beschr.*, v, 1826, p. 186.

**maculipennis**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 574.
Hab. India.

### Genus Agromyza.

Fallen, *Dipter. Suec.*, 1823; Chlorops, pt. Fallen.

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**tristella**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 609.
Hab. China.

### Genus EURHINA.

Meig., *Syst. Beschr.*, vi, 1830, p. 191.

**albovariegata**, Thomson, *Fregat. Eugenies Resa, Stockholm*, 1858–68, p. 606.
Hab. Malacca.

### Family PHORIDÆ.

J. Bigot, *adhuc inedict.*; Heteromyzides, Trineurides, Phytomyzides, pt. Fallen; Scatomyzidæ, pt. *Regn. Anim.*, Hypocera, pt. Latr.; Trineurodæ, pt. Meig., *Syst. Beschr.*, vi, 1830, p. 8; Sphæroceridæ, pt. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 561; Putrellideæ, pt. p. 796, Rob. Desv., *Myod.*, 1830; Phoridæ, Schiner, *Faun. Austr.*, 2nd Pt., 1864, p. 335; Phoridæ, Rond., *Prodr.*, i, pp, 12–27, 1856; Hypoceridæ, (*olim*), J. Bigot.

### Genus PHORA.

Latr., *Précis*, 1796; Bibio, pt. Fabr.; Trineura, (*olim*), Meig., *Klassif.*, 1804, id. Zetterst., *Dipt. Scandin*, Conicera, Meig., *Syst. Beschr.*, vi, *Hamm*, 1830, p. 226; Metopina, pt. Macq., *S. à Buff. Dipt.*, ii, *Supplt.*, *Paris*, 1835, p. 666.

**sinensis**, Schiner, *Novar. Reise*, 1868, p. 224.
Hab. China.

**orientalis**, id. ibid., p. 224.
Hab. Kondul.

**cleghorni**, J. Bigot, *Indian Economic. Entomol.*, vol. i, 1890, p. 191.
Hab. Bengal.

## ANOMALOCERATI.

J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 225, etc.; Pupipara, Nitzsch, *Germar Magaz.*, ii, 1818; Hippoboscidæ, p. 644, Schiner, *Faun. Austriac. d. Flieg.*, 2nd Pt., 1864, et Nycteribidæ, id. ibid., p. 650; Leach, *Mem. Wern. Soc.*, 1817; Coriaceæ, Latr., *H. Nat. Ins.*, 1802, id. Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 634; Phthiromyiæ, Latr., *H. Nat. Ins.*, iv, 1809; Hippobascidæ, Nycteribidæ, Streblidæ, pt. Rondani, *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1873; Phthiridium, pt. Hermann, 1804; Cryptoceres, (*olim*, 1852), Zoobiæ, Melitobiæ, Nycteribiæ pt. Streblidi, Zoobidi, pt. J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 230, etc.

### Family ZOOBIDÆ, (Zoobidi).

J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 232.

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## Genus Polyctenes.

Waterhouse, *Trans. Ent. Soc.*, iv, *London*, 1879, p. 311.

**lyræ**, id. ibid., p. 311.
Hab. Madras.

**spasmæ**, id. ibid., p. 312.
Hab. Java.

## Genus Myophthiria.

Rond., *Ann. d. Mus. Civic. d. Stor. Nat. d. Genova*, 1875, p. 464.

**reduvioides**, id. ibid., p. 464.
Hab. Borneo.

## Genus Ornithomyia.

Latr., *H. Nat. Crust. Ins.*, iii, 1802; Hippobosca, pt. Linn. (et auctor.).

**nigricans**, Leach, *Eprobosc. Ins.*, p. 12.
Hab. Bengal, Sumatra.

**columbæ**, Wiedem., *Anal. Entom.*, p. 60.
Hab. Java.

**javana**, Jaennicke, *N. Exot. Dipter.*, *Frankfort*, 1867, p. 98.
Hab. Java.

## Genus Hippobosca.

Linn., *Faun. Suec.*, 1781, p. 471; Nirmomyia, pt. Nitzsch.; Zoomyia, J. Bigot, *Ann. Soc. Ent. France*, 1885.

**sivæ**, J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 235.
Hab. India.

**calopsis**, id. ibid., p. 236.
Hab. Ceylon.

**variegata**, Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., 1830, p. 603.
Hab. India.

**francilloni**, Leach, *Eprobasc. Ins.*, p. 8.
Hab. Bengal; Africa.

## Genus Olfersia.

Leach, *Edimb. Encyclop.*, xi, 1819, (et auctor.); Feronia, pt. Leach; Ornitophila, Rond., *Bullet. d. Soc. Ital.*, xi, p. 3; Nirmomyia, pt. Nittch.

**longipalpis**, Macq., *S. à Buff. Dipt.*, ii, *Paris*, 1835, p. 640.
Hab. Java.

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**spinifera**, Leach, *Eprob. Ins.*, p. 11; Synon. Feronia, id. (V. Wiedem., *Ausser. Europ. Zweiflug. Ins.*, 2nd Pt., *Hamm*, 1830, p. 607; et Schiner, *Novar. Reise*, 1868, p. 373).
Hab. Batavia, Cape of Good Hope?

## Family STREBLIDÆ, (Streblidi).

J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 231; Streblidæ, pt. Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1878, p. 166.

### Genus RAYMONDIA.

Frauenfeld., *Wien Akad. Gitzber.*, xviii, 1855, p. 320.

**kollari**, id. ibid., p. 339.
Hab. Madras.

**huberi**, id. ibid., p. 331.
Hab. Madras.

## Family NYCTERIBIDÆ, (Nycterilidi).

J. Bigot, *Ann. Soc. Ent. France*, 1885, p. 235; (Nycteribiæ, id., *olim*), Nycteribidæ, Leach, *Mem. Wern. Soc.*, 1817; Nyctoribidæ, Schiner, *Fauna Austriaca d. Flieg.*, 2nd Pt., 1864, p. 650.

### Genus NYCTERIBIA.

Latr., *H. Nat. Crust. et Ins.*, 1803, vol. iv, p. 364; Acarus, pt. Linn.; Hippobosca, pt. Voigt.; Phthiridium pt. Hermann; Celeripes, pt. Montaign, *Linn. Trans.*, ix, 1808.

**sykesii**, Wesw., *On Nycteribia, Trans. of Zool. Soc., London*, 1834, p. 288.
Hab. India.

**hopei**, id. ibid., p. 289.
Hab. Bengal.

**roylii**, id. ibid., p. 290.
Hab. India.

**jenynsii**, id. ibid., p. 291.
Hab. India, Ceylon, Amboina, Sumatra.

**minuta**, V. d. Wulp, *Sumatra Exped.*, p. 58.
Hab. Sumatra.

**ferrarii**, Rond., *Ann. d. Mus. Civ. d. Stor. Nat. d. Genova*, 1878, p. 156.
Hab. Java.

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# JOURNAL

OF THE

# ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE.

No. III.—1892.


## I.—*Note on the Indian Butterflies comprised in the subgenus* Pademma *of the genus* Euploea:—*By* LIONEL DE NICE'VILLE, F. E. S., C. M. Z. S.

[Received August 15th;—Read November 2nd, 1892.]

In the August Proceedings of the Society, p. 158 will be found a note on the subgenus *Stictoplœa*, mainly based on material received from the Rev. Walter A. Hamilton and collected in the Khasi Hills. The present note owes its origin to the same source, over 200 specimens of *Pademma* having been sent to me from that region by Mr. Hamilton. The subgenus *Pademma* occurs in Ceylon, South India, Bengal as far west as Maldah, the lower slopes of the Sikkim hills, Bhutan, Assam, Burma, the Malay Peninsula, Siam, Cochin China, Nias Island, and Hainan. Its headquarters appears to be Assam and Burma (especially the former), where it may be said to swarm; everywhere else it is comparatively rare, except perhaps in Calcutta, where *E. kollari*, Felder, may be met with in considerable numbers if looked for in the right places and at the right seasons of the year.

The subgenus as represented in Ceylon, South India, Orissa, Bengal (usually), and in parts of Burma and in the Malay Peninsula, presents the curious phenomenon that the several species are in both sexes entirely, or but slightly, on the upperside of the wings, more especially



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the forewing, unglossed with blue; but in some parts of Bengal (Maldah), and in Sikkim, specimens are met with which are either entirely unglossed, or partly glossed with blue, towards the base of the wing, while in Assam, Arakan and Pegu the whole of the forewing is usually most richly blue-glossed. This phenomenon may be due to mimicry, as in the Khasi Hills of Assam, where *Pademmas* are individually most numerous, *Euplœa midamus*, Linnæus (*linnæi*, Moore), is also exceedingly common, and the *Pademmas* probably mimic it or some other blue-glossed species. The only thing to be said against this theory is that in Maldah where many specimens are most distinctly glossed with blue there are no other blue *Euplœas* which these *Pademmas* could mimic; the occurrence of these latter in Maldah may, however, be due to immigration.

The next point to be dealt with is the extraordinary variability of the subgenus. The species which is found in Ceylon (*E. sinhala*, Moore) appears to be quite constant, as do specimens of *E. kollari*, Felder, received from South India, the Eastern and Western Ghâts, Orissa, and Calcutta. But directly the hills are approached, at Maldah north of the Ganges and at the foot of the Sikkim hills, the species commences to vary and to approach *E. klugii*, Moore, both as regards the presence of a more or less well-marked blue gloss, and in the acquisition of discal markings to the forewing. But for these intermediate specimens, *E. kollari* might be considered to be a good and constant species, but, as it is, in certain parts of north-eastern India it is distinctly variable. As we proceed to the eastwards, in Bhutan, Assam, and the northern and middle divisions of Burma (Arakan and Pegu), blue-glossed species mainly prevail, though occasionally specimens almost as free from the gloss as is *E. kollari* are met with. Lastly, in the southernmost division of Burma (Tenasserim) the blue-glossed species have almost disappeared, being as rare as unglossed are in Assam, and are replaced by unglossed species which differ in the character of the markings from the continental Indian species, *E. kollari*. In the Malay Peninsula *Pademmas* are very rare, and are of the Tenasserim form. To a certain extent, therefore, we can divide up the Indian *Pademmas* into more or less well-defined geographical races, which, were they only constant each in its own region, might be retained as distinct species. But this is not entirely so. *E. kollari* gradually merges into *E. klugii* in Maldah and the lower slopes of the Sikkim Hills, and *E. klugii* equally gradually grades into *E. erichsonii*, Felder, in Arakan. In their respective headquarters the two extreme forms are perfectly constant and recognisable at a glance, *E. kollari* from any part of India south of the Ganges, and *E. erichsonii* from Lower Tenasserim or the Malay Peninsula. On the border-lands between these regions the several species are no longer

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reliably distinct, and in the Khasi Hills, which may be said to be the head-quarters of the *Pademmas*, as there they exist in the greatest number of individuals, a bewildering multiplicity of various forms is met with. Messrs. Butler and Moore, but especially the latter, have described a great number of these quite inconstant forms as distinct species, and the present writer with the material at his disposal, could if desired, easily describe a dozen more such species, many of them far more distinct in superficial appearance than several of Messrs. Moore and Butler's. It appears to him that the only way to deal satisfactorily with these puzzling species is to treat all of them (except *E. sinhala* which appears to be constant owing to its insular habitat) as geographical races of the earliest described *E. klugii*. To this end he has given below the full synonymy of the various forms and a brief description of them.

I must once more enter my protest against the erroneous views held by home naturalists on the variability of these species. Messrs. Wood-Mason, Marshall, Distant, Elwes, Adamson, Doherty, Watson, and I, all of whom know these insects in life and have lived amongst them, have written page upon page to shew how inconstant they are, yet Mr. Moore, who has never been in the East, in his latest work on butterflies ("Lepidoptera Indica"), admits eight distinct species, and eight named "Varieties" of *Pademma*, all but one of the latter of which he described as good and distinct species in 1883. When a species is obviously so extremely variable as *E. klugii*, it can be of no possible scientific use to have names for every possible combination and permutation of the blue-glossing of the upperside and of the disposition of the markings of both sides of the wings. These variations are obviously mainly individual, and from the same batch of eggs it is almost certain that several at least of these variations would be obtained were they carefully bred. It is, however, of great scientific use to make out the range and to describe the peculiarities of geographical races when these are constant and sufficiently well-marked for definition each in its own area, but this Mr. Moore never makes the slightest attempt to do. It is hoped that what has been here written will tend to this desirable result.

I might also mention to shew the absurdity of the views expressed by Mr. Moore in his Monograph of *Euplœina* written in 1883, in which seventeen distinct species of *Pademma* are given from India,—that I sent to him, just after the appearance of that paper, 12 very variable specimens of *Pademma* captured in the Arakan Hills, out of which he could only name three. The inference was that the other nine specimens represented as many "new species."

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1. Euplœa (Pademma) sinhala, Moore.

*Euplœa sinhala*, Moore, Ann. and Mag. of Nat. Hist., fourth series, vol. xx, p. 45 (1877); id. (part), Marshall and de Nicéville, Butt. of India, vol. i, p. 66, n. 47 (1882); *Isamia sinhala*, Moore, Lep. Cey., vol. i, p. 10, pl. v, fig. 1, *male* (1880); *Pademma sinhala*, Moore, Proc. Zool. Soc. Lond., 1883, p. 309, n. 18; idem, id., Lep. Ind., vol. i, p. 126, pl. xlvii, figs. 3, *male*; 3*a*, *female* (1890).

Habitat: Ceylon.

Expanse: ♂, ♀, 3·25 to 3·85 inches.

Description: Male. Upperside, *both wings* dark olive-brown. *Forewing* with the outer marginal area broadly much paler than the rest of the wing, bearing in the middle of the pale area a series of from six to eight small ochreous-white spots, the one in the first median interspace the largest, often two in the submedian interspace; a marginal series of dots variable in number, but usually four, commencing at the anal angle and never reaching the apex of the wing; the usual oval sexual brand in the submedian interspace. *Hindwing* with the outer margin paler than the rest of the wing, but less markedly so than in the forewing; the usual flour-like sexual patch about the anterior area of the discoidal cell; a submarginal series of twelve ochreous-white spots, the four anterior ones round, decreasing in size towards the costa, placed one in each interspace, the posterior ones elongated into streaks, placed two in each interspace; an almost complete marginal series of dots much larger than those in the forewing, not quite reaching the apex of the wing, placed in pairs in the interspaces. Underside, *both wings* paler olive-brown than on the upperside. *Forewing* somewhat darker in the middle of the disc; a costal spot placed between the bases of the first and second subcostal nervules; discal spots placed beyond the cell varying from two to four, the lowermost spot in the submedian interspace the largest, all these spots bluish-white; submarginal and marginal series of spots as on the upperside, but the latter more numerous; inner margin of the wing up to the first median nervule cinereous; the sexual brand black and prominent. *Hindwing* with none, one, or two discal spots placed just beyond the cell; submarginal and marginal spots as on the upperside. Female, rather paler than the male throughout, lacking all the secondary sexual characters, and having the inner margin of the forewing straight, not strongly outwardly bowed. Underside, *forewing* has the inner margin cinereous as far as the submedian fold.

*E. sinhala* occurs only in Ceylon, and is, for an *Euplœa* of this group, owing to its insular position, fairly constant.

2. Euplœa (Pademma) klugii, Moore.

*Euplœa klugii*, Moore, Horsfield and Moore, Cat. Lep. Mus. E. I. C., vol. i, p. 130,

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n. 258 (1857); idem, id., Anderson, Anat. and Zool. Researches, p. 922 (1878); id., Marshall and de Nicéville, Butt. of Ind, vol. i, p. 64, n. 44 (1882); id, Adamson, Notes on the *Danainæ* of Burmah, p. 8 (1889); idem, id., Cat. of Butt. coll. in Burmah, p. 4, n. 20 (1889); id., Watson, Journ. Bomb. Nat. Hist. Soc., vol. vi, p. 29, n. 8 (1891); *Salpinx klugii*, Butler, Journ. Linn. Soc. Lond., Zoology, vol. xiv, p. 294, n. 35 (1878); *E. (Pademma) klugii*, Wood-Mason and de Nicéville, Journ. A. S. B., vol. lv, pt. 2, p. 346, n. 10 (1886); *Pademma klugii*, Moore, Lep. Ind., vol. i, p. 117, pl. xlii, figs. 1, *male*; 1*a*, *female*; 1*b*, *female* (type of *E. grantii*) (1890); *Pademma klugi*, Moore, Proc. Zool. Soc. Lond., 1883, p. 305, n. 1, pl. xxxii, fig. 1, *male*; *Euplœa (Pademma) klugi*, Elwes, Trans. Ent. Soc. Lond., 1888, p 300, n. 9; *Euplœa erichsonii*, Felder, Reise Novara, Lep., vol. ii, p. 324, n. 444 (1865); id., Marshall and de Nicéville, Butt. of India, vol. i, p. 63, n. 42 (1882); id., Watson, Journ. Bomb. Nat. Hist. Soc., vol. iii, p. 18, n. 13 (1888); id., Adamson, Cat. of Butt. coll. in Burmah, p. 4, n. 18 (1889); id., Watson, Journ. Bomb. Nat. Hist. Soc., vol. vi, p. 29, n. 7 (1891); id., Shopland, Butt. coll. in Aracan, p. 4; *Euplœa (Pademma) erichsonii*, Wood-Mason and de Nicéville, Journ. A. S. B., vol. lv, pt. 2, p. 347, n. 11 (1886); id., Elwes and de Nicéville, Journ. A. S. B., vol. lv, pt. 2, p 415, n. 7 (1886); *Salpinx erichsonii*, Butler, Journ. Linn. Soc. Lond., Zoology, vol. xiv, p. 295, n. 39 (1878); *Pademma erichsonii*, Moore, Journ. Linn. Soc. Lond., Zoology, vol. xxi, p. 31 (1886); *Pademma erichsoni*, Moore, Proc. Zool. Soc. Lond., 1883, p. 307, n. 11; *Euplœa erichsoni*, Adamson, Notes on *Danainæ* of Burmah, p. 7 (1889); *Euplœa kollari*, Felder, Reise Novara, Lep., vol. ii, p. 325, n. 445 (1865); *Pademma kollari*, Moore, Proc. Zool. Soc. Lond., 1883, p. 309, n. 19, pl. xxix, fig. 9, *male*; id., Swinhoe, Proc. Zool. Soc. Lond., 1885, p. 126, n. 8; id, Hampson, Journ. A. S. B., vol. lvii, pt. 2, p. 348, n. 8; id., Moore, Lep. Ind, vol. i, p 124, pl. xlvii, figs. 2, *male*; 2*a*, *female* (1890); *E. (Pademma) kollari*, de Nicéville, Journ. A. S. B., vol. liv, pt. 2, p. 41, n. 8 (1885); id, Taylor, List of the Butt. of Khorda in Orissa, p. 1, n. 8 (1888); id., Elwes, Trans. Ent. Soc. Lond., 1888, p. 301, n. 10; id., Ferguson, Journ. Bomb. Nat. Hist. Soc., vol. vi, p. 435, n. 9 (1891); *Euplœa crassa*, Butler, Proc. Zool. Soc. Lond., 1866, p. 278, n. 31; id., Distant, Rhop. Malay., p. 29, n. 9, pl. v, fig. 8, *male* (1882); p. 410, n. 9 (1886); id., Marshall and de Nicéville, Butt. of India, vol. i, p. 63, n. 41 (1882); id, Watson, Journ. Bomb. Nat. Hist. Soc., vol. iii, p. 18, n. 12 (1888); id., Adamson, Cat. of Butt. coll. in Burmah, p. 4, n. 17 (1889); idem, id., Notes on *Danainæ* of Burmah, p. 7 (1889); id., Shopland, Butt. coll. in Aracan, p. 4; *Salpinx crassa*, Butler, Journ. Linn. Soc. Lond., Zoology, vol. xiv, p. 295, n. 38 (1878); id., Moore, Proc. Zool. Soc. Lond., 1878, p. 822; *Pademma crassa*, Moore, Proc. Zool. Soc. Lond., 1883, p. 307, n. 9; idem, id., Lep. Ind., vol. i, p. 121, pl. xlv, figs. 2, *male*; 2*a*, *female* (1890); *Salpinx illustris*, Butler, Journ. Linn. Soc. Lond., Zoology, vol. xiv, p. 294, n. 36 (1878); *Euplœa illustris*, Marshall and de Nicéville, Butt. of India, vol. i, p. 66, n. 46 (1882); id., Shopland, Butt. coll. in Aracan, p. 4; *Pademma illustris*, Moore, Proc. Zool. Soc. Lond., 1883, p. 307, n. 7; idem, id., Lep. Ind, vol. i, p. 119, pl. xliii, figs. 1, *male*; 1*a*, *female* (1890); *Salpinx masoni*, Moore, Proc. Zool. Soc. Lond., 1878, p. 823; *Euplœa masoni*, Marshall and de Nicéville, Butt. of India, vol i, p. 64, n. 43 (1882); id., Adamson, Cat. of Butt. coll. in Burmah, p. 4, n. 19 (1889); id., Notes on *Danainæ* of Burmah, p. 7 (1889); *Pademma masoni*, Moore, Proc. Zool. Soc. Lond., 1883, p. 309, n. 17; idem, id., Lep. Ind., vol. i, p. 123, pl. xlvi, fig. 1, *male* (1890); *Salpinx grantii*, Butler, Trans. Ent. Soc. Lond., 1879, p. 2; *Euplœa grantii*, Marshall and de Nicéville, Butt. of India, vol. i, p. 65, n. 45 (1882); id., Adamson, Cat. of Butt. coll. in Burmah, p. 4 (1889); id., Shopland, Butt. coll. in Aracan, p. 4; *Pademma granti*, Moore,

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Proc. Zool. Soc. Lond., 1883, p. 306, n. 2; *Isamia rothneyi*, Moore, Ent. Month. Mag., vol. xix, p. 34 (1882); *Euplœa sinhala* (part, *nec* Moore), Marshall and de Nicéville, Butt. of India, vol. i, p. 66, n. 47, pl. vii, fig. 12, *male* and *female* (1882); *Pademma dharma*, Moore, Proc. Zool. Soc. Lond., 1883, p. 306, n. 3, pl. xxxii, fig. 2, *female*; *Pademma augusta*, Moore, Proc. Zool. Soc. Lond., 1883, p. 306, n. 4; idem, id., Lep. Ind., vol. i, p. 118, pl. xlii, figs. 2, *male*; 2*a*, *female* (1890); *Pademma indigofera*, Moore, Proc. Zool. Soc. Lond., 1883, p. 306, n. 5, pl. xxxii, fig. 3, *male*; idem, id., Lep. Ind., vol. i, p. 120, pl. xliv, fig. 3, *male* (1890); *Pademma imperialis*, Moore, Proc. Zool. Soc. Lond., 1883, p. 307, n. 6; idem, id., Lep. Ind., vol. i, p. 119, pl. xliii, figs. 2, *male*; 2*a*, *female* (1890); *Pademma regalis*, Moore, Proc. Zool. Soc. Lond., 1883, p. 307, n. 8; idem, id., Lep. Ind., vol. i, p. 119, pl. xliv, figs. 1, *male*; 1*a*, *female* (1890); *Pademma pembertoni*, Moore, Proc. Zool. Soc. Lond., 1883, p. 308, n. 12, pl. xxxii, fig. 6, *male*; idem, id., Lep. Ind., vol. i, p. 124, pl. xlvi, figs. 3, *male*; 3*a*, *female* (1890); *Pademma macclellandi*, Moore, Proc. Zool. Soc. Lond., 1883, p. 308, n. 13, pl. xxxii, fig. 4, *female*; idem, id., Lep. Ind., vol. i, p. 120, pl. xliv, figs. 2, *male*; 2*a*, *female* (1890); *Pademma uniformis*, Moore, Proc. Zool. Soc. Lond., 1883, p. 308, n. 14; idem, id., Lep. Ind., vol. i, p. 124, pl. xlvii, fig. 1, *male* (1890); *Pademma apicalis*, Moore, Proc. Zool. Soc. Lond., 1883, p. 308, n. 15; idem, id., Lep. Ind., vol. i, p. 123, pl. xlvi, figs. 2, *male*; 2*a*, *female* (1890); *Euplœa apicalis*, Shopland, Butt. coll. in Aracan, p. 4; *Pademma burmeisteri*, Moore, Proc. Zool. Soc. Lond., 1883, p. 309, n. 16; idem, id., Lep. Ind., vol. i, p. 123, pl. xlv, figs. 3, *male*; 3*a*, *female* (1890); *Pademma sherwillii*, Moore, Lep. Ind., vol. i, p. 120, pl. xlv, fig. 1, *male* (1890).

Geographical race *E. kollari*, Felder.

HABITAT: South India, Orissa, Bengal, lower slopes of the Sikkim Hills.

EXPANSE: ♂, 3·3 to 4·1; ♀, 3·7 to 4·1 inches.

DESCRIPTION: MALE and FEMALE. Differs only from *E. sinhala*, Moore, in the marginal spots of the forewing on both sides being rather larger and reaching the apex of the wing usually; the submarginal series also rather larger. In all other respects as in *E. sinhala*.

It is rather stretching a point to admit *E. kollari* as distinct from *E. sinhala*, but as the differences noted above appear to be constant and are just recognisable, I have thought it best to separate them.

Except in Bengal, where *E. kollari* is found in the Sikkim terai and on the lower outer slopes of the Sikkim hills and in Maldah, it appears to be confined to the littoral, the furthest point from the coast where I have any record of its occurrence being Poona, about 70 miles in a straight line from the sea, and Bhadrachalam, on the Godavari, Madras, which is about 100. Neither is it found in the hills except at the lower elevations up to about 2,000 feet, save in the Nilgiris, where Mr. Hampson took it at 3,500 feet elevation. In South India, Orissa and Bengal (with some exceptions) the species is quite constant, it is only at Bholahât in the Maldah district and on the lower slopes of the Sikkim hills and in

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the Sikkim terai that the species begins to vary, acquiring a more or less well-marked blue gloss on the upperside of the wings, and some discal spots on the forewing, which leads us to the typical form of the species.

Typical form *E. klugii*, Moore.

HABITAT: Maldah, lower slopes of the Sikkim Hills, Bhutan, Assam, Arakan, Pegu.

EXPANSE: ♂, 3·5 to 4·0; ♀, 3·0 to 4·2 inches.

DESCRIPTION: MALE. UPPERSIDE. [Of all the species of *Euplœa* known to me this is the most variable.. Following the order of the *Pademma* group here adopted, the varieties which most nearly resemble *E. kollari* are first described, while the true *E. klugii*, which is the most divergent form in one direction, is next described, and lastly those variations are described which lead up to the geographical race *E. erichsonii*, Felder, which ends the series.] A specimen from Sikkim in my collection agrees absolutely with typical *E. sinhala*, Moore, from Ceylon, except that the base of the forewing on the upperside in some lights is slightly blue-glossed; other Sikkim specimens I possess have the submarginal and marginal spots to both wings rather smaller than in typical *E. kollari*, while others again are normal in this respect, both the latter forms being slightly blue-glossed. In the next gradation the dark basal area of the forewing on the upperside is less well marked, and extends more towards the outer margin, while the first discal spots divided by the lower discoidal nervule have appeared; these varieties occurring in Sikkim, Assam, and Arakan, but always sparingly. In the next group, which includes the typical *E. klugii*, it is quite impossible to describe within reasonable limits all the variations which occur. The dark basal area now gradually disappears altogether, the blue-glossing becomes more and more intense till it reaches its maximum, the spots of the wings are infinitely variable—in some there are the two marginal series only, in some one or both these series are obsolete on the hindwing, in some the marginal series is confined in the forewing to a few at the anal angle, or are absent altogether, while the submarginal series are sometimes reduced from the full number of nine to four mere dots towards the apex; the discal spots vary from a complete series of four to none at all; while in some specimens there is a large spot at the end of the discoidal cell, in others a small spot, and in others again no spot at all; the colour of the spots also varies, some are pure white, others strongly glossed with blue; there is sometimes a costal spot at the base of the first and second subcostal nervules, this being frequently absent. On the hindwing some specimens are richly blue-glossed on the disc, while

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others are not glossed at all; some are rich chestnut-coloured towards the abdominal margin, this colour also being found in some examples on the bowed-out inner margin of the forewing. UNDERSIDE. The variations of the spots on both wings described above as found on the upperside of the wings are also found on the underside, though to a less extent. FEMALE varies in precisely the same way as does the male. The variations noted above are found throughout the range of the typical form, but they reach their maximum development in the Khasi Hills, where I have been able to accurately match the following species figured in Moore's "Lepidoptera Indica"—*E. klugii*, *E. augusta*, *E. illustris*, *E. imperialis*, *E. regalis*, *E. macclellandi*, *E. indigofera*, *E. sherwillii*, and *E. uniformis*.

Geographical race *E. erichsonii*, Felder.

HABITAT: [Maldah, one female; Cachar, one female], Arakan, Pegu, Tenasserim, Malay Peninsula, Siam, Cochin China.

EXPANSE: ♂, 3·2 to 4·0; ♀, 3·7 to 4·1 inches.

DESCRIPTION: MALE. UPPERSIDE. [Still continuing the same order of the *Pademma* group, I first take up the description of the varieties most nearly approaching the last geographical race.] The connecting link between the *E. klugii* race and the one now under consideration is *E. masoni*, Moore, which has the basal area of the forewing on the upperside glossed with bright violet-blue, which character typically connects this race with *E. kollari*, Felder, from which, however, it may be distinguished by the submarginal series of spots gradually increasing in size from the anal angle till the one in the subcostal interspace is reached, then again rapidly decreasing to the costa. But for this single character it would, I think, be quite impossible to separate some forms of *E. erichsonii* from *E. kollari*. This geographical race is not as variable as the last, though it is still very variable, Mr. Moore placing in it *E. crassa* (=*E. erichsonii*), *E. burmeisteri*, *E. masoni*, *E. apicalis*, and *E. pembertoni*. The spots on both wings are almost as variable as in *E. klugii*, except that the discal spots of the forewing never exceed two in number and are usually absent altogether, and I have seen no specimen with a spot in the discoidal cell. FEMALE, markings throughout similar to those of the male.

The two female specimens, one each from Maldah and Cachar, mentioned under habitat above, quite upset the otherwise fairly well-defined geographical distribution of this local race. These two specimens both possess the submarginal series of spots on the forewing of the typical shape of *E. erichsonii*, so I am reluctantly obliged to include them under that race. I have other aberrant male specimens from Arakan which I

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have placed under *E. klugii*, as they are very richly blue-glossed at the base of the forewing, and have a large spot in the discoidal cell, but the submarginal spots are typically those of *E. erichsonii*, so these specimens have two characters of *E. klugii* and one of *E. erichsonii*. The two races over-lap in Arakan and Pegu, and many specimens from thence are almost intermediate between the two local races, so that the placing them in one or the other is purely arbitrary.

I have taken great pains to try and define the three geographical races of *E. klugii* which at most can be admitted, but now that I have finished the task, I am almost of opinion that it would have been more philosophical and scientific to have dealt with the very large series of specimens I possess as one species in the way in which I treated *E.* (*Stictoplœa*) *harrisii*, Felder. There is no doubt, however, that *E. kollari* is constant in certain localities, as also is *E. erichsonii* in other localities, these being the two extremes of the series, just in the same way that *E. harrisii* and *E. hopei* are as distinct in their respective head-quarters, it is only when one comes to consider the intermediate forms which occur in a region geographically intermediate between the two extreme forms, that it is found that the constancy of all the forms immediately breaks down. To deal with species like these it is imperatively necessary to have very extensive series of specimens from all the localities in which they occur, and also to act up to the spirit of the theory of evolution which nearly all naturalists profess to believe in, but some naturalists entirely ignore in their writings when describing different species of animals. If my individual opinions and conclusions be not accepted, I beg that reference be made to the writings of the competent field-naturalists who have studied these butterflies in life. It is needless here to recapitulate what they have recorded: reference to these papers is in all cases given in the synonymy of *E. klugii*.

There is still another point I may mention. Perhaps of all the oriental butterflies, *Euplœas* are, where they occur at all, amongst the most commonly met with, conspicuous, and most easily captured of insects. They are so obviously protected that they float about in the air in the quietest manner and seem to court attention, and moreover are always, or nearly so, the commonest of butterflies. So well has the Indian region been explored that I should almost as soon expect to find a new "Cabbage-White" in a London square as a new *Euplœa* in any part of India; and it is to be hoped that no more "new species" will be described from India unless they are obviously quite different from any hitherto known species. Doubtless from unexplored regions and islands many new species yet remain to be described, but certainly there are none from India.



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*The Communal Barracks of Primitive Races.—By* S. E. Peal, Esq.

Plates I and II.

[Received ; Read November 2].

Among the many social problems relating to the early history of our race which at the present day engage the attention of anthropologists, there are probably few which surpass in interest that of the origin of "Marriage."

The institution of the "family," with its attendant maternal and paternal duties, is so closely interwoven with all human history and customs that it is generally, and perhaps with some reason, taken to have been the normal form of development from the very first.

But in these days when the doctrine of evolution has taken such a firm hold of the scientific world, it is hardly necessary to point out that sooner or later, we may have to reconsider the entire question, guided by the light of recent discoveries.

In our endeavour to unravel the earlier phases of social life, we naturally look amongst the more savage races for traces of the social condition of our ancestors, piecing together slowly and carefully the relics of customs still surviving here and there, which may tend to throw light on this obscure and difficult question, drawing therefrom such deductions as experience teaches may be safe and legitimate.

From a careful study of the evidence recently accumulated, there can be little doubt that very much has yet to be learnt regarding the earlier forms of sexual relation.

MacLennan, to whom we owe so much on the question of "Primitive marriage," has endeavoured to shew that "marriage by capture" probably arose from paucity of females, due to infanticide, and that really some form of monogamy had always existed, but more recent evidence seems to shew that Sir John Lubbock's view is more likely to be correct, *i. e.*, that while marriage, or the private right to one particular woman by any man, arose by capture, this early stage of social development was possibly preceded by one of complete sexual liberty, as in a horde.

The relics of such a stage of sexual communism seem to survive far more extensively among savage and semi-civilized races in our day than is generally supposed, especially in the Indo-Pacific and Australian regions, and the object of the present note is to draw attention to the large stores of information on this question already in hand, but so far unutilized.

Letourneau, in his "*Evolution of Marriage*," in the contemporary science series, has exhaustively traced for us the earlier stages of

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"marriage and the family" amongst the lower animals, shewing conclusively that they are by no means peculiarly human institutions.

The various and singular forms of sexual association, past and present, he has also clearly laid before us, though singularly enough entirely omitting one which is of the utmost importance, and to which it is desirable to draw attention. The omission is in regard to the peculiar institution of barracks for the unmarried, which under so many surviving forms, and endless names, extends from the Himalaya and Formosa on the north, to New Zealand and Australia on the south; from eastern Polynesia, to the west coast of Africa.

One of the first things to strike the student who is fairly well acquainted with the head-hunting and semi-savage races of the north-eastern frontier of Bengal, on reading travels in the Malayo-Pacific Archipelago, is the similarity, and at times identity, of so many singular customs over this widely scattered region.

Not only do we find, as Sir Henry Yule pointed out in the *Journal of the Anthropological Institute* for February 1880, that head-hunting, pile-dwelling, blackening the teeth, aversion to milk, "jhuming," and barracks for the unmarried, extend from India to New Guinea and other places, but that when the matter is carefully looked into, quite a large number of other singular customs come into view, and that the area over which these customs prevail, extends over a far larger part of the earth's surface than Sir Henry Yule had suspected.

Taken by itself this institution of organized "barracks for the unmarried," is sufficiently suggestive; but when we notice that it is only one of many peculiar social customs, which survive more or less with it, among widely scattered races, the case is doubly noteworthy; first as a proof of former racial affinity among all these people, and secondly, as a most important and suggestive factor in social evolution generally.

Their sociological significance it is the more necessary to study as they are so obviously survivals; and under modified forms are seen amongst Indo-Mongols, Dravidians and Kols, Malays, Papuans, Polynesians, Australians, and African races.

For some years past racial affinity has been suspected among these now distant races, and in these communal barracks we seem to have a clear proof that the "survival of the fittest" among human customs may long outlast both physical and linguistic variation.

As might naturally be expected, with customs handed down from a remote antiquity, among various races, there has been a large amount of local geographical variation, and in some instances the subsidiary customs have died out entirely.

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Thus "jhuming" which so strongly differentiates all these, from Aryan races, is not found among the nomadic Australians. Cannibalism again, which at one time was probably universal, has died out in most cases, or survives in the passion for "head-hunting" in several.

The building of houses on piles is another singular habit which persists among many widely scattered groups, and that it is a survival and not locally spontaneous, is beautifully demonstrated by the "araiba" or extension of the platform floor, beyond the end of the roof, which is characteristic of Indo-Mongols, Borneans, Papuans, the dwellers in the Phillipines, and other widely-scattered people.

The platform burial, common around Assam, is also seen in New Guinea, Borneo, Formosa, Sumatra, &c.

The vertical double cylinder bellows, seen all over our north-eastern frontier as far as the Lutze, (Anong) turns up again in Nias off Sumatra, in the Ké Islands, North Australia, and in Madagascar in identically the same forms.

Our Nagas and other tribes climb trees by cutting notches for the toes, precisely as do the Australians, and use the bamboo pegged to a tree stem as a ladder, the same as the Dyaks.

The extraordinary hide cuirasses worn by the savages in the island of Nias, to keep out arrows and spears, are absolutely identical with those till lately used by our Nagas, and which are now rendered useless by fire-arms.

The large canoe war drums of Polynesia, the "Lali" of Fiji, and "Tavaka" of the New Hebrides are seen all through our Naga hills, and stranger still, have the "crocodile heads" carved at the extremities, though the animal is unknown locally.

The bamboo Jew's harp of the Phillipines and New Britain, sounds in all our Naga villages. The singular perineal bandage of New Guinea is here also quite common.

These are a few of the very singular instances of survivals, which unexpectedly meet us over a wide area, among races now considered more or less distinct, and which demonstrate a common origin in the far past, among races too, wherein the communal barracks for the unmarried is a persistent feature.

As before stated, many of these subsidiary social customs have varied, or died out entirely, here and there, due no doubt to differences in the physical surroundings, and in the barracks themselves we see often variations to suit local, or recent, requirements, which indeed is one good proof of extreme antiquity:

But certain features in relation to them have so persistently

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remained, that they are probably fundamental necessities in the case.

Firstly, we see in all, except among the nomadic Australians, that there is a special and recognized building, or buildings, for the unmarried young men and lads to sleep in, and at times for the young women, also in many cases together.

Secondly, we notice that among the races having these barracks without exception, there is complete liberty between the sexes until marriage.

Thirdly, and most significant of all, these barracks are invariably tabu to the *married women*, whether the race, or tribe is exogamic or endogamic.

We may also note that, as a general rule, we see adult marriages where this social system is in vogue, and conjugal fidelity seems greater than among the more civilized races, by whom juvenile chastity is valued.

The crux of the entire question appears to be in the fact that from Bhutan to New Zealand from the Marquesas to the Niger, there is a distinct tabu raised against the married woman, as against a social interloper or innovation; and among tribes and races where otherwise there was complete sexual liberty, she is, in all cases, legislated against as an inferior, or slave.

If "marriage" had preceded the barrack system, it would, in many instances, have dominated it; but there are no traces of peaceful equality even between the parties to marriages in the past; everything tends to shew that the wife was a captured slave, and hence private property, as much so as a spear or pig.

As we see (still) among some savage races, the males killed or captured in a raid were invariably eaten, and the females reserved as slaves, or as we say "wives," and hence marriage arose in all these cases through capture, giving the successful warrior a right to one woman.

To many persons this feature of "barracks" for the unmarried, combined as it is with juvenile sexual liberty, and strict tabu against the married women, may appear so novel, that a few references to particulars and authorities may not be out of place. We can at the same time note the local variations, due to the geographical surroundings, or to the social advance of the race.

For instance among the semi-civilized Buddhist Shans of eastern Assam the "chang" is a semi-temple, and boys' school-house, where the lads at times reside for fixed periods, and which is tabu to women.

Among the Abor tribes, north-east of Assam, the "Mosup" is

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seen in every village, and Mr. J. F. Needham describes them in the *Proceedings of the Royal Geographical Soc.*, May 1886, as at times 240 feet long by 30 wide, with 24 fire places. These are not only the guest and council houses, but among head-hunters are the guard-houses in which "the single men warriors reside," and where "certain warriors are told off daily, who keep a look out day and night."

"The side walls are crammed with the heads of every description of animal, and all down the centre of it, are to be seen the bows, arrows, fishing gear, hats, spears, &c., of the warriors, on bamboo trays. The "Mosup" is close to the entrance to the village and would hold about 500 men."

"The unmarried girls have apparently any amount of latitude given to them," and are very fond of singing and dancing. In the early dawn he was roused by yells throughout the village, and on enquiry was told it was an order from the "Mosup" going round for a general holiday next day, and that every man, woman and child was to remain in, and not go to work in the "jhums."

Among the Miri these communal buildings are called "De-ri," and there are (as among the Abors) several in each village. They are not only the guest and council houses but the recognized sleeping places for the unmarried young men and young women, boys and girls, between whom until marriage, as in all these cases, there are no restrictions.

As might naturally be expected, they are strictly tabu to the married women.

Among the Miris settled long in the plains, there is a very distinct advance in individualism, and in small communities the "De-ri" is declining into a boy's play house, though the freedom between the sexes, in the unmarried state, is not curtailed, and may be called notorious.

The great Naga communities whether savage head-hunters, or peacefully inclined, present us with various forms of these communal barracks. In some of the large eastern villages, as many as 10 or 12 for young men, and 4 or 5 for unmarried girls are found. As a rule those for the young men, are guard houses, placed so as to cover the entrances to the village. Each being manned by the lads and young warriors of the adjacent section of the village, or "*morong*."

Between the Dikhu and Disang rivers among the tribes descended from Sangloi, these barracks or guard houses are called "Pah," and as there are probably an average of 6 to each of the 60 villages; there would be about 360 Pah on an area of some 600 square miles.

In some tribes on this tract, there are no distinct houses or "Páh," for unmarried girls, who sleep at home, and in Zu, the head village

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of the Baupara tribe, those for the young unmarried men are named as follows:—

| | | | | | |
|---|---|---|---|---|---|
| 1. | Ra man | Pah. | 7. | Ko nu | Pah * |
| 2. | Pak Ké | ,, | 8. | Nok sa | ,, |
| 3. | Vong tong | ,, * | 9. | Nai tong | ,, * |
| 4. | Ra Nok | ,, | 10. | O hin | ,, * |
| 5. | Ten tok | ,, | 11. | Pa nu | |
| 6. | Lo tong | ,, * | 12. | Pa sa | |
| | | | 13. | Vang hum Pah. | |

The first six belong to the smaller half of the village (which is divided by a deep khud, whence water is obtained from natural springs). The other seven are in the other portion of the village which includes the residence of the chief or "Vang hum." The "Pah" marked thus* are large ones commanding entrances to the village and are more or less fortified. Towards the centre of the village there are several Pum Pah (3 or 4) for little boys. The others are manned by the young men who take it in turn to mount guard, day and night, 15 or 20 at a time, but who in this tribe take their meals at home.

Among a few of these tribes, the adults as well as juveniles are habitually nude, and in all of them, until 17 or 18 years of age, both sexes are absolutely so, except when visiting the plains.

Here as among the "*Wild races of S. E. India,*" (by Colonel Lewin,) "great license is allowed before marriage to the youth of both sexes," p. 193; "every lad before marriage has his sweet-heart and he cohabits with her whenever opportunity serves, p. 203. The intercourse between both sexes is free and unrestrained until after marriage," p. 245.

In most cases these "Pah" are obviously associated with communal customs of the highest importance to the tribe, not only are they the schools in which the youths are graded and taught their duties, and use of arms, but they are the recognized rallying centres in times of public danger. Each contributes its share in all public labor, such as repairing fortifications, clearing roads bridging rivers and in building the houses, &c.

They lie in fact at the basis of the social life as relics of a more extensive communal system, which is slowly giving way to individualism, and here, as elsewhere, the "Pah" are tabu to the married woman.

West of the Dikhu river we find these communal barracks for young men, are called "Arizu," by the "Ao" or Haimong. Besides being the guest, council, and guard-houses the Arizu has the control of all war matters, and fortification, has charge of the big village drum,

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sees to the fastening of the village gates at night, and other public matters.

There are it seems three orders or grades in these "Arizu:" 1st, the Scangpur; 2nd, the Tanabanger; and 3rd the Tepue (or Tepoe) and those who have passed through all and are still unmarried are called Azuiner.

As an illustration of the organization of the "barracks" in one of its many phases, a little detail may here be of some use.

The Scangpur are the lowest grade; they bring wood and water and are the servants of the other grades. *No parent can interfere* with the discipline, and as the term of each order is for three years, the discipline of the lower order is considerable and valuable.

When the other orders come in at night, tired from labor or from being on the war path, the Scangpur has plenty to do in shampooing and manipulating the legs, arms and backs of the weary or sick.

The second order or Tanabanger have less drudgery, but they have some; if there is wood needed for fencing or repairs of the "Arizu," the two lower grades have to do the irksome parts, and the term of service here also is for three years.

The third order, or Tepue, are the masters and instructors, and on entering it there is much rejoicing. In a war party they carry spear shield, and dao, the lower orders carrying the provisions, &c. The Ao have their kidong, or bougoh, and appoint one officer called sensong. Above all is one called "Unger." This last order has a great feast at the end of three years when it retires; the material is what the Arizu three orders have earned in the three years by going now and then to work on cultivation for rich men

All of these three orders eat with their parents or elder brothers and usually work for them.

The number of "Arizu" houses in a village depends on circumstances, usually at least two, located near the chief entrances, occasionally there are 5 or 6 so as to afford sleeping places for the boys and young men.

This tribe has been annexed by us for some years, but in most of the villages the "Arizu" houses are kept up though there is now no warfare, and the boys are all expected to work for and be subject to their parents.

In some of these Ao villages there are, or used to be, "Arizu" for girls and unmarried young women, under control of elderly matrons.

Among the Mikirs (or Arleng) we again find communal barracks called "Tarengs." Boys enter them at from 8 to 10 years of age and there is generally but one to each village. Those who join the "Tareng" do so for a fixed period of 5 or 6 years or longer, after which it is

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broken up, and those who wish to leave go out. When they form one they elect head men to it. The first is called Cleng sarpo and highest, the second is Cleng doon, and the third is called Sodar keta, the fourth Sodar loo.

No married man or one who is a widower ever joins a "Tareng," and there are none for girls. No girls, young women or married women may go near them, and they are used as council and guard-houses as well as being the regular sleeping barracks of the unmarried young men.

Anything happening is first reported to the Cleng sarpo, and thence to the villagers and head men. Any one visiting the village sleeps in the "Tareng," and any young man from the "Tareng" can go to any house he likes and sleep with an unmarried girl; her parents can make no objection. When once a "Tareng" is formed no one can leave it until it breaks up, or he is fined.

Among the Lushais a traveller informs us that "the custom is in all these villages, that the young men on arrival at a certain age, are expelled from their father's house at night, and sleep all together in the Zalbuk, or bachelors' house. The Zalbuk is one large room, inside a verandah.

Colonel T. H. Lewin frequently and very clearly refers to this custom in his "*Wild races of S. E. India*" and to the liberty allowed between the sexes before marriage, (see pages 119, 121, 182, 193, 201, 203, 245 and 254), making it particularly clear that among the "Hill tracts" therein referred to, the young unmarried men and lads are graded and governed by special communal laws, and that these dominate the rights of the parent, as will be gathered from the remark:—"his mother abused them much, but the father and mother could not hurt them as they were acting by the Goung's orders."

We constantly indeed find proofs that the right of the parents over their children is more or less subordinate to that of the communal barrack, that "the family" in fact as the social unit, is not yet emancipated, but holds a subordinate position in the body politic.

To a moral certainty, the above few instances do not represent a tenth part of the information which a systematic survey would reveal, in regard to this momentous subject, among the Indo-Mongolian races, but enough has probably been said to shew that these communal barracks are a social feature of importance, deserving more careful study.

Turning now to Bengal and Central India, with its mixed and aboriginal races, we find these barracks in some form or other among the Gonds, Konds, Sonthals, Kols and others. According to the Revd. S. Hyslop, the Konds and Gonds have "in their villages *bothies* for bachelors." Among the Gaiti Gonds and Koitars, "each village has a house, or gotalghar (empty bed house) for single unmarried men to sleep in, and also similar ones for unmarried girls and women."



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The Juangs (in Keonjur) have the same, and after work and eating, the young men drum and dance, while the girls sing. The Revd. E. Petrick, who lived as a Missionary for some years at Ranchi, informs me that under the name of "Damkuria" these communal barracks for the unmarried (of both sexes) are seen in all Sonthali and Oraon villages, and that before marriage there is complete liberty between the sexes.

Mr. W. H. P. Driver, who has had large experience among these races, confirms the above. Speaking of the Koroas (*Journal A. S. B., Volume LX, Part I, No. II,* 1891) he says :—

"Every large village has its "Damkuria" or bachelors' quarter, for boys who are too old to live with their parents," girls stay with their parents until they are married. The dancing ground "acra," is usually an open space in front of the Damkuria, and young people enjoy considerable freedom until they are married.

Turning now to the Archipelago and Pacific region, we find in more or less modified forms this singular social institution common all over New Guinea, and the houses conspicuous as "Dubus, Dobo, Dupa, Marea," &c.

Many of our best travellers and missionaries have given us excellent descriptions of them, and the customs pertaining thereto, though in many cases failing to perceive their sociological significance.

Considering the great difference between the Papuan and Indo-Mongol races, and the distance separating these areas, the similarity between the "Mosup," "Pah," "Arizu," &c., and the Papuan, "Dubu," "Marea," &c., is most extraordinary.

Not only are they in each case abnormally large and long semi-sacred communal buildings, which serve as guest and council halls, decorated with skull trophies of war, or feasting, and specially set apart as the sleeping places for the young unmarried men ; but we find the structure and arrangement of the houses almost identical, not only are they characterized by extreme length, but in all cases the floors are raised on piles 6 to 10 feet high, we even see such a detail of construction as the peculiar Naga "hum tong," Miri "tung gong," or projecting siesta platform which is common among all Indo-Mongol houses, urning up in the Papuan "Araiba," identical in office and structure.

Internally we see a long hall, with fire-places and sleeping bunks each side. Last and most significant of all we find that in all cases these houses are strictly tabu to women.

In saying that the extraordinary identity seen between these Indo-Mongol aud Papuan buildings and their objects, cannot possibly be the result of accidental coincidence we tacitly admit the existence of a far-reaching social relation between these now distinct races.

The Revd. J. Chalmers, describing Ipaivaitani's "Dubu," says :—

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"He himself led me by the hand, women and children remaining behind, men and youths preceding and following until we came to the "Dubu" itself, where I was met by a number of old men who waved their hands and bade me welcome. Inside and on each side of the long beautiful aisle were seated young men, legs crossed, and arms folded not speaking a word, while I was led down the aisle by the chief, followed by the old men until we came near the end where we stayed a few minutes, and I was then told to turn, on doing which all the seated ones rose, followed me out and a general conversation went on."

This is almost precisely the etiquette pursued in our Naga hills, see *Journal A. S. B. Volume XLI, Part I, of* 1872 pages 17 and 18."

Further on Chalmers says :—"The temple, for a native building, was really good. In front was a large platform, and immediately under the great high peak in front, was a large verandah, on which the men sat sheltered from the sun and rain. I looked down an aisle nearly 200 feet in length. Inside the whole place was divided into compartments, in each of which there were fires, where the owners spent much of their time in eating and sleeping."

Speaking of the Maiva villages in the Papuan Gulf Mr. Lawes says :—"The sacred house, a fine building 120 feet × 24, was assigned for lodging. Inside the building was furnished with series of shelves or platforms, the upright posts were mostly carved, one at the entrance having a full length figure of a crocodile on one side, and a human figure on the other. The Dupu or sacred house has its times of more than ordinary sanctity, at such periods it is profusely decorated, and no woman's or child's eye is permitted to see it. The sacred house of each village generally stands at the end of the single street, and the other houses are of poor construction."

In the *Journal R. G. S. for April* 1884, page 216, the Revd. W. G. Lawes refers to Mr. Chalmers' visit to Maclalchie point. "One Dubu or sacred house is described where two large posts 80 feet high support the large peaked portico, which is 30 ft. wide, while the whole building is 160 feet in length, and tapers down in height from the front. A large number of skulls of men, crocodiles, cassowaries and pigs, ornamented it. The human skulls are those of victims who have been killed and eaten by them."

These skull trophies which are met with all over the Pacific are a peculiar and suggestive counterpart to the identically similar skull trophies seen among most of the Indo-Mongolian races. Among the head-hunting Nagas, as many as 350 skulls, of men, women. and children, may at times be seen carefully ranged, in a "Pah," like the flower pots in a hot-house, the posts and beams being hung with boar, mithan and deer skulls tier over tier.

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Sigr. D'Albertis, in several places in his travels in New Guinea, describes the "Marea," as guest and council houses, tabu to women, and situated at the end of a street of houses. At page 194 he refers to a corpse which was "taken to the house of the unmarried young men."

In many works of travel we see illustrations of the Marea or Dubu in New Guinea, as being situated at the end of a street, where the houses of the married people are placed end on, in two rows facing each other. At page 140 D'Albertis illustrates a "Marea" (at Para's village) 300 ft. long × 36 to 45 wide, this being the public hall and sacred house, but in this instance the huts of the married people are built (also on piles,) as a row of miniature houses along each side of the main communal building, and joined thereto by little flying bridges, across which the women dare not pass, their exit being by little doors and ladders down on the outer side.

Viewed in plan this arrangement of the large communal hall in the centre, with the married quarters all divided off along each side, is absolutely identical with the ground plan of many Indo-Mongolian houses, where there is a long and wide common central apartment, at times reduced to a passage, and off which on each side, are the rooms of the married couples all partitioned off, with their own fire-places, and with ladders and doors in the outer walls.

Among the Arfak villages Sr. D'Albertis alludes to the houses built on piles, wherein the men and women live, in one, divided down the middle by a partition, the men one side the women on the other, and they eat apart.

Captain Strachan in his "*Expedition to New Guinea*," page 166, says:—Some of the houses of the Turi Turi were from 100 to 150 ft. long, the women and the men lived in separate houses, not even the married people living together. The houses are raised from the ground and a broad step ladder leads to a platform at either end. There are also platforms at the sides with several small doors or openings at intervals along the building." Sr. D'Albertis, (pp. 319-20), referring to the Mou, Miori, and Erine villages, says that the houses are in 2 rows, while large houses called "Marea" on piles, and tabu to women, contain skull trophies, and have no doors, but platforms in front called "Araiba" 6 to 12 feet high. These are the young unmarried men's sleeping houses.

Dr. Holrong refers to these "Marea" or "Dubus," when he says: "The young men live together in one building which is distinguished by the figure of a man." (*Pro., R. G. S.* 1888, page 602).

Mr. J. C. Galton writing in "*Nature*," (page 205, 1880) of Maclay's travels, says that the "Buam ram ra," or sacred house is strictly tabu to women and children, while the "Barum" or great drum and all musical

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instruments are also tabu to them, but are played by the "Malassi" or unmarried young men; and women eat by themselves.

Thus we see on the great island of Papua amongst races now distinct in physique and language from our Indo-Mongolians, Dravidians, and Kols, these singular communal barracks. Under the names of "Dubu, Marea, or Buam ram ra," these peculiar and conspicuous semi-sacred houses are built on piles, decorated with skull trophies, used as guest and council houses, with the projecting siesta platform, are the sleeping places of the young men, and strictly tabu to the women, the family live in subordinate huts.

In Dr. Guppy's "*Solmon Islands*" page 57, we find that:—"In the large villages, the houses are generally built (on piles) in double rows with a common thoroughfare between; the tambu house occupies usually a central position, and has a staging in front. Page 67:—"In the the tambu houses of St. Christoval and the adjoining Islands, we have a style of building on which all the mechanical skill of which the natives are possessed has been brought to bear. These sacred buildings have many and varied uses. Women are forbidden to enter their walls, and in some coast villages as at Sapuna in the Island of S. Duna, where the tambu house overlooks the beach, women are not permitted to cross the beach in front. The interior of these houses is free to any man to lie down and sleep in."

If we turn to the Bismark Archipelago, the Louisiades, and New Hebrides we find either recent or former traces in them of these social barracks and many of the customs which so commonly accompany them such as "jhuming," tatooing, pile building, head-hunting, &c., and here there are canoe houses.

Mr. W. Powell, referring to the little houses of the natives on New Britain, says:—"For each village two large houses are built; one for the men the other for the women, no man is allowed in the woman's house, nor is any woman allowed in the man's house, the latter is generally used for a council house. They are lined with bunks made of bamboo which extend along both sides, serving as beds or seats."

Near Port Webber he found, in a clearing, several houses, a large one in the centre, a council or reception house, with the large "garamoot" or wooden drum before it. This house "might have been, as in other parts of New Britain, *a young man's sleeping house.*"

"When in want of women for their young men to marry (as they may not marry into their own tribe), they make a raid against the bush tribes of Byning and seize the young women, eating the bodies of the men killed or taken prisoners."

Captain C. Bridge in the *Proceedings R. G. S.*, September 1886, page 549, informs us that "at Ambrym (New Hebrides) and some

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other islands the young, unmarried men in a village always sleep in a large house specially set apart for them." And in the Pelew Islands "in each village there are large club-houses to which the younger men resort, a few women from neighbouring villages also frequent them. It is not considered *comme il faut* for a woman to enter one in her own village. If she did she would become an outcaste; going into one a mile or two off, however, in no way affects her position."

As far off indeed as New Zealand we find the so-called "bachelors' barracks" have spread from Polynesia. In a note from Mr. S. Percy Smith, he says:—"The bachelors' barrack is a Polynesian institution, known in New Zealand as the "Wharee Matoro," which was the sleeping place of the young men, and often of the young women too. *Wharee* means "house" and *Matoro* is the advance made by women towards the other sex (often used *vice versa* also). These "wharee" were also the places where the village guests were entertained. Sexual intercourse between the young and unmarried was quite unconstrained in former times."

Turning north to Formosa we find that Mr. G. Taylor, in the *Proceedings, R. G. S.* for 1889, page 231, says that in the aboriginal villages there are one or more buildings called "Palong Kans," which are large houses built to accomodate the youths from the time they attain puberty until married. Their food is prepared by the parents and taken to the "Palong Kan," the lads are never allowed to reside in the paternal home. All public matters are discussed in the "Palong Kans" and it is of the nature of a caravanserai, as any visitor may enter, hang up his belongings and begin cooking at the public fire.

By day the building is watched by the youths in turn. On the receipt of any intelligence necessitating a meeting of the villagers, the watchers attach to their waists the iron bells which always hang at the door, and run through the village, regulating their speed by the importance of the matter to be discussed.

Dr. Warbung again at page 743 refers to the Formosan skull hunts, blood money, and "club houses for young men."

In Borneo again we find a large number of savage races, many of them notorious head-hunters, and who in physique and customs are almost identical with our Indo-Mongols of the hills round, and south of Assam. Not only among Dyaks and Nagas do we see, jhum cultivation, building on piles, houses 200 and 300 feet long, head-hunting, blackening the teeth, aversion to milk, and barracks for the unmarried youths; but singular details absolutely identical such as the bamboo pegged to a tree stem for a ladder, getting fire by see-sawing a long strip of dry cane under a dry branch held down by the foot, &c.

According to Sir Henry Yule:—"In Borneo as well as among the

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tribes of the Assam frontier, we find in each village one or more public halls used for public ceremonies, but which also form dormitories of the unmarried young men of the community and serve thus as a sort of main guard to the village, and in these halls both in Borneo and Assam is often seen suspended the treasure of trophy skulls. Hence St. John often calls them head-houses and sometimes bachelors' houses." Unfortunately St. John's "*Life in the forests of the far East*" is not in our library, and I must be content with the above single quotation.

Wallace, however, in his Malay Archipelago, page 50, says, "My things were taken "up to the "head-house," a circular building attached to most Dyak villages, and serving as a lodging for strangers and the place for trade. The sleeping room of the unmarried youths, and the general council chamber."

It may not be out of place to notice here, that in some cases the type of Chief's house is the same as those seen in the hills round Assam, and in New Guinea.

In Mr. D. D. Daly's note on the explorations in British North Borneo, (*Proceedings R. G. S.* January 1888, p. 6) he says:—"At Punpun, the head man is Rendom, who lives in a large house, raised ten feet off the ground; there is a centre passage through the top part with many rooms containing families on either side." This is structurally identical with our Chiefs' houses in the Naga hills, and many other places, see "*Nature*" June 19, 1884 p. 169.

The difficulty of tracing these barracks among the savage tribes in Sumatra has been considerable. So far my only source of information has been the short notice in the "*Illustrated London News*" of September 12th, 1891, p. 335, of M. Julius Claine's trip among the Battak Karo, in May 1890. He says:—"The town of Sirbaya is divided into several "kampongs," separated by bamboo palisade and ruled by their respective chiefs. The houses are built on piles of squared timber. In front of the house is a raised platform with a staircase of bamboo. The interior is one large room with a trench along the middle of the floor serving as a passage from end to end. This abode is occupied by the family Patriarch, with his married sons and daughters and their children, each branch of the family having its allotted place.

They pass much of their time on the outer terrace or platform, and occasionally sleep there at night. A dozen married couples with their offspring, or nearly 100 persons, may inhabit one such dwelling. Unmarried young men live together in a large house sometimes of two stories, which is set apart for them.

So that here again in Sumatra we find unmistakably this singular social institution, and according to "*Nature*" August 13th, 1885, p. 346, these Battaks are "head-hunters."

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Whether the segregation of unmarried youths is seen in the island of Nias, and among the Tagal and Igorotte of Luzon, and the forest nomadics of central Sumatra I cannot say, but over the whole of Polynesia it seems to have co-existed with a stage of complete sexual liberty which now appears shocking to us.

For many years one of the greatest difficulties met with by the Missionaries over this region was the absence of terms in all the languages, denoting virtue, modesty and chastity. The attempts to explain these terms to old or young alike, were met by shrieks of laughter, as they were utterly incomprehensible.

In all cases this universal and naive immodesty seems to have co-existed with the communal barracks sacred to men only, whether among exogamic or endogamic communities, and even among those as in "Taipi" of the Marquesas, where marriage, as we understand it, had not been fully developed, or hardly begun.

In the "*Narrative of a four months' residence in the Typee Valley of Nukuhiva, one of the Marquesas, in* 1847," Mr. Hermann Melville fully describes the "Ti" or bachelors' hall, "at least 200 feet in length, though not more than 20 in breadth; the whole front of this structure was completely open. Its interior presented the appearance of an immense lounging-place, the entire floor being strewn with successive layers of mats. Thus far we had been accompanied by a troop of the natives of both sexes, but as soon as we approached its vicinity, the females gradually separated themselves from the crowd, and standing aloof, permitted us to pass on. Inside, muskets, rude spears, and war clubs were ranged around."

This is an almost exact repetition of Mr. Needham's description of the Abors' "bachelors' hall", or "Mosup" (*Proceeding, R. G. S.* May, 1886, p. 317.) "80 yards longand 10 yards wide," and is entirely open along the whole of one side. In this house all the single men warriors reside, and it is also used as a council room, and the arms are also stored in it as in the "Ti," of the "Marquesas."

The most remarkable feature in regard to Typee is that while in that instance the sexual liberty was unusually complete, and the "bachelors' barracks" seen in its purest form, the institution of "marriage" was yet in its infancy and from the very nature of the conditions was developing on endogamic lines.

The "capture of wives" appears in that case to have been practically an impossibility, as a rule, and hence it may be one of the rare instances where monogamy or polyandry arose by endogamy. But the marriage tie, or "nuptial alliance" seems to have been of a very simple nature, and easily dissolved.

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In the case of "Taipi," we see a tribe confined to a valley 9 or 10 miles long by 1 or 2 wide, living on bread-fruit, plantains, cocoanuts, yams, growing spontaneously; no cultivation, and possessing no cattle: only the pig; their houses scattered among the trees, not grouped into villages; and having perpetual feud with Happar and Nukuhiva, adjoining tribes, eating these enemies when slain. The absence of marriage except in a rudimentary (endogamic) form, the complete sexual liberty, utter ignorance of modesty, and remarkable development of the Ti, or barracks tabu to women, are as singular as the general happiness and plenty, absence of sickness and crime.

For many years past an obscure relation has been observed in many ways between the Indo-Pacific region and East Africa; it crops up in several matters, and hence we need not be surprized at finding that, in variously modified forms, our communal barracks for the unmarried are seen among the Massai and other races. Dr. Parkes noticed them on the Congo. In the *Proceedings, R. G. S.* for December, 1884, page 701, Mr. Joseph Thomson says:—"The most remarkable distinctions characterise the various epochs in the life-history of the Massai. The boys and girls up to a certain age live with their parents, and feed upon meat, grain, and curdled milk. At the age of 12 with the girls, and 12 to 14 with the boys, they are sent from the married men's Kral, to one in which there are only unmarried young men and women. There they live in a very indiscribable manner till they are married."

"At this stage the men are warriors and their sole occupation is cattle-lifting and amusing themselves at home. The young women attend to the cattle and build the huts, and perform other necessary household duties. So pleasant does the Massai warrior find this life that he seldom marries till he has passed the prime of life and finds his strength decline. The great war spear and heavy buffalo-hide shield, the sword and the knobkerry are laid aside. For a time—a month—he dons the dress of an unmarried woman, and thereafter becomes a staid and respectable member of Massai society." The habits of this strange tribe are purely nomadic, they move about according to the pastures. Their houses are formed of bent boughs, plastered with dung."

Again Mr. D. K. Cross, in the *Proceedings, R. G. S.* February 1891, page 87, referring to the Awamwamba of Nyassaland, thus describes the village houses of the unmarried people:—"the unmarried men or "wakenja" as they are called, live in long-shaped houses often 50 feet or 60 in length built of bamboo. No man is allowed to marry till he is about 30, and able to buy a wife. The herds are kept in separate houses which are long like those of the unmarried men."



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Traces of the "bachelors' barracks," young men's clubs, and fetich houses tabu to women, are, I believe, found all across Africa, both among Bechuanas and Caffres, and the Bakalai of the Gaboon.

Thus we appear to have in the case of the Massai, at least one instance in Africa, of organized sexual promiscuity as a social phase preceding marriage. Hitherto we have seen, this feature among more settled races, in this instance it is seen among semi-nomadics, where from the nature of the surroundings, in past times, the development of "marriage" appears to have been retarded by the ample supplies of food due to a pastoral life.

In strong contrast to this, we find among the Australian races, who are truly nomadic, and where food is procured with difficulty, that the possession of a wife (*i. e.*, female slave) is of the utmost importance socially and early marriage the rule. A man's wealth is measured by the number of his "lubras." Yet strange to say these races who have no settled villages or permanent buildings, exhibit the two social features so conspicuous in those having bachelors' barrack, *i. e*, complete sexual liberty among juveniles in the clan or horde, and isolation of the young men from the married families.

It has been urged by MacLennan in his "*Primitive Marriage*," pp. 85, 86 and 87, and by Peschel in his "*Races of Man*," pp, 223, 224 and 5, that the cause of exogamy has been due to the horror of consanguinity, and that it is among rude and savage races "that a horror of incest is developed most strongly." Apparently the fact has been unknown, or overlooked, that it is precisely among such races that we see the most complete, most unlimited, and socially recognized sexual liberty permitted within the tribe or clan *until* marriage, whether it is endogamic or exogamic; that the "communal barracks" are in fact in many cases directly due to this fact, and hence are universally tabu to the married woman whether a captive or not. It is precisely in consequence of the sexual license attached to these barracks, that they *are tabu*. So that this "horror of incest" is really a fiction. It is much to be regretted that the want of a little more practical knowledge of savages and semi-civilized races, has caused MacLennan, Peschel and others, to make such a serious mistake as to suppose that exogamy and wife capture, were due to a "horror of consanguinity," a "terror of such alliances," and that (MacLennan, l. c. p. 232), "It is precisely nations in the most primitive stage which have the greatest abhorrence of incestuous marriage," and hence practice wife stealing so as to avoid it. This view of the savages' morality is necessarily ludicrous to all who understand the "communal barracks," and the sexual orgies so common among races having this institution, and wherein they are

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viewed as *harmless juvenile amusements.* A view which extends from the Himalaya to New Zealand, and from the Marquesas to the Gaboon and beyond.

But to return to our (exogamic) Australians, and the traces of the barrack system among these nomadic races. Mr. Brough Smyth at page 36 of his great work says:—"The unmarried young men have a place set apart for them in the camps, and they are not permitted to associate with the females, page 62. At the "mur rum" initiation of a girl by old women, after being painted, young men (20 or so) approach and take an oath not to assault her, but she may entertain any of them of her own free will as a lover, till married.

As marriage is only possible by capture or exchange, a man with no female relations (to barter) is an object of suspicion, and has to "share the discomforts of the bachelors' quarters." (page 86). A man calls a woman of the same caste (or clan) "Wartoa," *i. e.*, *sister*, and cannot marry her, yet connections of a less virtuous character which take place between them, do not appear to be considered *incestuous.*" "Intercourse between the males and females belonging to the same class, appear to be regarded without disfavor." "In arranging the "miams" (in a camp) care is taken to separate the unmarried young men from the married females and their families. It is not permitted to the young men to mix with females, but the young people of both sexes evade all precautions generally," (p. 124).

"When one tribe visits another, huts are built for them by the hosts, and one is set apart for the young unmarried men," (p. 135).

Again young men are taunted by the young women of their own tribe, if they marry outside by peaceful arrangement, (*i. e.*, they object to loss of their lovers), (vol. II, p. 82).

The above are a few references out of many (in one work) to the fact that, excepting the married woman alone, there was complete sexual liberty within the horde or clan, between those calling themselves brothers and sisters. This be it observed among races where their strict exogamy is, or has been, attributed to the dread and "horror" of *risk* of incestuous intercourse. There can be little doubt that as Mr. Horatio Hale and others believe, the Australians are a degenerate race, or that they have carried with them into adverse surroundings, these two remarkable social features of complete sexual liberty within the clan, and the segregation of the unmarried youths, after exogamy arose. They exhibit one of the rare cases where among savages the increased importance of marriage and the "wife"—as a food gatherer,—has dominated the relics of the barrack system. It is the opposite of what we have seen among the Massai, where the com-

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munal barracks appear to have survived in greater purity than elsewhere, due possibly to the absence of inducement to develope the marriage system.

It is instructive to note that while in the main perhaps, the development of social arrangements may have been from a stage of communism, through "wife capture," to endogamy, these three stages are not necessarily so incompatible as to be impossible together at one and the same time. Among many of our Indo-Mongoloid races we see all the three forms existing together in the same community. Taking the Banpara tribe as an illustration, we see in the head village Zu, as before noted, complete sexual liberty until marriage, and 13 typical bachelors' barracks or Pah, which are also skull-houses, guard-houses, council-and guest-halls, strictly tabu to married women.

This sexual liberty before marriage, is part and parcel of the whole social organization, and has been so apparently from time immemorial, producing no bad results, and is strenuously defended by old and young alike. If any grown girl becomes pregnant, which is a rare case until after marriage, there is very little trouble caused, as the young fellow to whom she is most partial is then allowed to marry her, with less delay and expense than usual. A feature in the case is noteworthy, *i. e.*, that, as a rule, by the time a young man has reached the age of 24 or 25, and a girl 20, both settle down as quiet and sedate parties while still in the early prime of life. The stage of excitement is over, and it is exceedingly rare to find infidelity; divorces being less frequent than among civilized races who value juvenile chastity. But side by side with this unlimited sexual liberty before marriage, we see that among the chiefs of these same tribes, who are great sticklers for etiquette and customs, their marriages are strictly exogamous, they may not marry into their own tribes. The Chopnu ("bear") chief must not marry a "bear," or Chopnu girl, but he may marry a Chanu or "tiger," or Yanu, "iron." A Yanu chief may marry a Chopnu but not a Yanu. At the same time, when young, all those chiefs have the same liberty precisely as the other young men, have several sweethearts, and at least before marriage, one or more concubines, from their own tribe, the children of whom, if any, do not become chiefs. These concubines are called "Karsais." Their "Kuries" or true wives are arranged for with other chiefs who have marriageable daughters, often a tedious and costly matter, including political alliance. The ceremony when it comes off is largely a mock capture, the bridegroom and large number of elaborately decorated warriors, in full war paint, with guns and spears, meet the bridal party on the tribal boundary, execute their war dances and bring the bride home to

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a grand feast and general drinking bout. The "Karsais" or concubines, meanwhile, are kept on, and as before, are practically servants, the Kuri indeed looks on them as indispensible. So that the chiefs are exogamic, and the marriage is a relic of wife capture, the ceremony often a mock capture or fight. But the rank and file of these head-hunting savages are now so closely packed all over these hills, and have been so for, at least 1,500 or 2,000 years that the difficulty of procuring wives, when so often at feud all round, has necessitated endogamous marriages, at first no doubt between different villages of the same tribe semi-independent. As a rule now, the common folk are endogamous, and the marriage is arranged by parents or relatives, at times by payment, and at others service, or both. In all cases, however, as amongst all the races having barracks, and sexual liberty, these marriages are adult, and not juvenile, as among Hindus and Mohamedans, and the parties themselves have the greatest say in the matter, they are not little puppets.

Of the three forms of sexual relation the oldest is probably the communal barrack system, which is so generally seen as at the basis of many tribal customs and which underlies the whole social life, a stage of exogamy, following but not superseding it, survives as a relic among the chiefs, while endogamy is apparently more recent, and in turn does not violently displace either of the others. The elastic relations existing between the villages constituting a distinct tribe, give us indeed the clue to the mode of transition from exogamy to endogamy. Occasionally a large village with one or more offshoots, will declare its independence, or two tribes (or clans) at peace agree to found a new settlement, which in time becomes distinct.

Indeed this has been the normal mode of tribal development over the entire area. Occasionally a single tribe or clan will be comprised in one large village or "chang," and at feud with all others around it for 6 or 8 years, and this has no doubt led to endogamy, especially as so many of these "changs," are at times built on semi-detached peaks, and are practically almost distinct villages. But the transition from exogamy to endogamy among these tribes, has evidently been exceedingly slow, possibly not less than thousands of years, judging by their unwritten history, which goes back in some cases about 30 generations, and which unless secured at an early date, will undoubtedly be lost for ever. The remarkable feature in the case is the steady persistence of the "barracks" all through, as a social survival from a period which evidently preceded the origin of these races as we now see them.

The sociological significance of these singular communal institutions, briefly referred to in the foregoing, it is imperatively necessary

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to study carefully if we hope to glimpse the earlier forms of social development, or settle whether man has been from the first "a pairing animal," and the family the unit, as some suppose, or whether the unit has been the small chiefless communal clan.

A general, if somewhat cursory survey in this research, is much more likely to elucidate the truth, than a very careful study of isolated instances, which vary so considerably, as to be at times probably misleading. Collectively these barracks seem to point to a communal origin, incompatible with the pre-existence of monogamy, the universality of the tabu against the married woman, among races wherein there is, and has been complete sexual liberty till marriage, seems to point out the married woman or captured slave, as a social interloper; she is not the superior or even the equal in the situation anywhere, but is universally legislated against as an inferior, the barrack dominates her and even her offspring. They are antagonistic.

One of the dangers of studying this subject exclusively from a few instances only, is seen in the fact that in many cases the tabu against the "wife," has gradually been extended to the other women and girls of the clan, a very natural development. But while there are apparently no cases wherein the married women can visit or sleep in these young men's barracks (in their own tribe) there are a large number wherein the unmarried girls can do so, and not a few in which these latter are *expected* to do so, or even in which special barracks (*Gabra morongs*) are built for them. Those who know anything of these primitive races, among whom we find these communal barracks and their utter disregard for juvenile chastity, must smile at the remark that "it is precisely among nations in the most primitive stage which have the greatest abhorrence of incestuous marriages," and that this drove them all into wife capture. As if to render this view still more ludicrous, Huth's "marriage of near kin," amounts to a demonstration that consanguineous marriages are not at all necessarily injurious, and may at times even be beneficial, as all breeders of stock well know and the race of Ptolemies demonstrated. That in the earlier stages of human development, ere social customs arose regulating the rights of property, there may have been a time when captured women were the public property of the horde, is not impossible. But as soon as rights in captured spoils were recognized, by races wherein there was sexual communism, and hence less internal competition for females, the right of the stronger warriors to keep their female captives as "wives," would be less disputed. The more valuable such females became as slaves, the more "wife capture" would be developed, as in Australia. MacLennan would appear to have been under misapprehension, when

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in arguing against the "origin of marriage" by *capture*, he thought it unlikely, because savages had "women of their own whom they could marry." It is precisely because in a communal stage, all the females of the tribe, or horde, were public property, that no male could isolate, and appropriate one, as his own *exclusively*, that the right to a captive female slave (as a wife) became feasible. She was private property.

The distinct private right to captured weapons, utensils or slaves, resulting from "joint action," is notorious among savages. Hence it is singular to see MacLennan insisting that the public right to a "beautiful captive," would stand as an argument against "marriage by capture." When we examine the matter closely, *in situ*, we find that invariably, the property captured in a joint raid, is never scrambled for, but subject to laws or rules minutely regulating the private rights of those engaged. Whether in fishing, hunting, or in raids for much coveted heads, to secure the envied tatooing, there are strict rules as to the rights in the spoils. I have known a case where the youngest lad in a head-hunting party alone secured the head, and the honor of tatooing, out of a party of 63 young warriors. Without strict and recognized rules in all such matters, there would be chronic social anarchy. So that when closely examined MacLennan's argument will not hold water. Whether an exhaustive study of these singular "communal barracks" seen among so many distinct races under such various local phases, will eventually shew us that they are the relics of a former stage of communism, it is not easy to see, but there are certain persistent features which appear to point in that direction, among others the universal tabu against the married women. If "marriage" by capture of female slaves, arose while society was in the stage of communal hordes, or clans, it is very easy to see that the successful warriors would naturally object to their female captives (or wives as we now call them) associating with the unmarried young men in their communal quarters, and hence tabu them. It is what we might naturally expect under the circumstances, and also that these warriors would generally have the power as well as the inclination to enforce such a social law. If there were no other females available for the rest of the males, it might not have been so easy perhaps, but when we recollect that in all these cases there was complete sexual liberty within the horde itself, among its normal female members, the successful isolation of the captive wives was probably feasible, and hence arose both the "marriage" and "tabu" simultaneously. The almost universal power of these communal relics, over the children, a power which, as a rule, dominates that of the parent, is another indication that marriage and the family are of more recent development. Indeed the

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indications that some forms of communal association preceded the isolation of the family turn up in several unexpected ways. At page 140 of his travels D'Albertis illustrates a "Marea" at Paras village 300 ft. long by about 36 wide, this being the great communal building, or sacred house, tabu to women, and in this instance the houses of the married folk, also built on piles, are two rows of little huts, one along each side of the great building, distinct from it, yet with little flying bridges to it, across which the men alone could pass, the women's access to them being by little doors and ladders on the outside, as in fig. B. This arrangement and isolation of the married people's quarters, on either side of a common hall or passage, seems to underlie the construction of houses very generally all over this part of the world, as in figure A. In the case of the "Mou Miori," (D'Alberts) l. c. pp. 319-20, these married quarters are no longer little appendages along each side of the Marea, but are really distinct houses, and set back, so as to form a wide street, in which the communal Marea is placed. And here again we see that this arrangement as a street, is very common, from Assam to the Pacific. We even see that the clear space between the rows of houses used for dancing on, has a distinct name, the "Akra" of the Oraons, the "Imrai" of new Hebrides, &c., fig C. All these houses are built on piles, 3 or 4 to 8-10 ft. long, and have the siesta platform S, projecting in front beyond the eaves; the "Airaba" of New Guinea, the "Tung gong" of Miris, and "Humtong" of Nagas. In all the figures, A. B. C. Co are the communal and M the married quarters.

The building of houses on piles which is very common among races having communal barracks, has long been a stumbling block to anthropologists. Mr. Crawford in his "*History of the Archipelago*," p. 159, attributes it to the people inhabiting marshes, banks of rivers, and the sea coast. Others say as a means of security from attacks of enimies or wild animals. But as Sir Henry Yule pointed out in the *Journal of the Anthropological Institute*, February 1880, page 296, it cannot be due to these and is really a race character.

The most likely cause for the custom seems to be the presence of the pig, which, as a domestic, or semi-domestic animal, is kept by almost all pile building races, and which unless there were some means taken to effectually frustrate its depredations, would devour everything edible within reach, infants included, as some of the people themselves point out. They could not go out to their jhums, without leaving a guard behind them. This "pile building" is one of the *allied customs* before alluded to; and exhibits the usual variation due to influence of physical surroundings.

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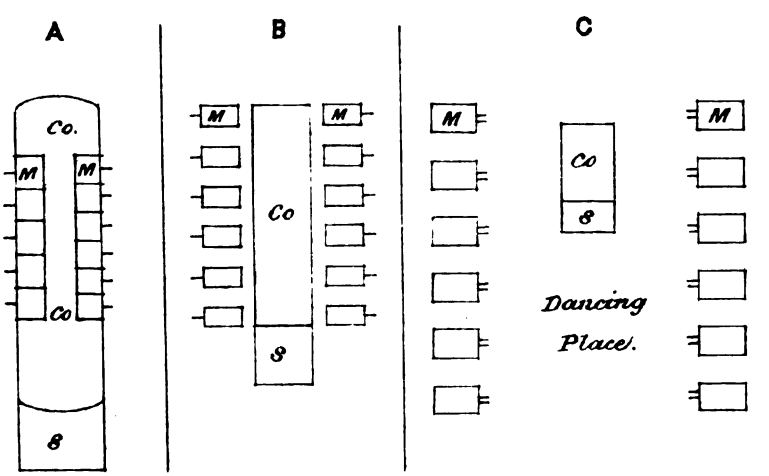
The fact that these barracks are found over such an immense area among such distinct races, and with such marked geographical variations, obviously due to the surroundings, indicates an extreme antiquity, preceding the differentiation of physique and even language, and being essentially of a communal nature they seem relics of a social stage preceding monogamy, and to demonstrate more or less clearly that marriage arose by capture. The extreme, and indeed *absolute* freedom between the sexes before marriage, culminating in many races, in sexual orgies, and the absence of the ideas of modesty and chastity, amply demonstrate that it could not have been the *dread of incest* which drove them into exogamy. There appears to be absolutely no evidence that a peaceful stage of monogamy preceded the communal barrack system, certainly no evidence of peaceful endogamy, or "marriage" within the horde or clan. Such evidence as we have is distinctly in favor of "marriage by capture," having arisen during a stage of communism, the relics of which we see surviving in these singular communal barracks. That they are doomed, and ere long will become extinct, is not at all doubtful to those who have watched them in some cases for 20 years. The trader and the missionary are rapidly changing the old order of things, and, even without their aid, there appears to be some evidence that among many of these races, the importance of the family is in the ascendant. It is most desirable therefore that these social relics should be studied systematically at an early date, the information gained would be of much value to anthropologists, and not entirely useless perhaps to those interested in such questions as infant marriage, and the age of consent.

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## *De Ranunculaceis Indicis Disputationes.*—Scripsit P. Brühl.

[Tab. iii, iv, v et vi].

### Praefatio.

Ex quo tempore Hooker filius et T. Thomson de Ranunculaceis indicis in volumine primo Florae imperii indici conscripserunt, maximus numerus exemplarium stirpium exsiccatarum adlatus est a Stoliczka, Anderson, Kurz, Prain, Henderson, Scully, Giles, Aitchison, Duke, Lace, Brandis, Schlich, Gamble, Ellis, Baden-Powell, Drummond, Davidson, Tanner, Sedgewick, C. B. Clarke, Watt, Gammie, Pantling, aliisque viris, magnaque speciminum copia cumulata est in herbariis calcuttensi et saharanpurensi summa industria atque cura Duthiei et Doctoris King, clarissimorum virorum illorum de rebus botanicis indicis optime meritorum. Ac peregrinationes laboresque Hancei, Henryi, Prattii, Davidi, Delavayi, Maximowiczii, Przewalskii, Potanini, qui, fortes ad pericula, desertorum terroribus vel hostium montiumque altissimorum frigoribus indomiti, Mongoliam et Tibetiam et Chinam propriam peragraverunt, atque species novae in imperio sinensi repertae et ab Maximowiczio, Franchetio, Hemsleyo, aliisque accuratissime descriptae ac definitae comparationem stirpium indicarum cum stirpibus regionum finitimarum reddiderunt faciliorem.

Quamobrem Ranunculaceas indicas denuo perscrutari et cum reliquis asiaticis et europaeis comparare instituimus, quamquam regnum nipalense vix exploratum et eae partes Himalayae quae a terra sikkimensi ad orientem vergunt adhuc fere ignotae nos impediunt ne quaestionem plane cumulateque perficiamus. Species autem Ranunculacearum valde variabiles sunt mirumque in modum polymorphae, ut perdifficile sit formas varias in species subspecies varietatesque disponere harumque fines regere. Ita fit ut genera plurima in species permultas, descriptionibus bene definitas, natura plane confusas, divulsa et quasi discerpta videamus. Facilius enim est apta dissolvere quam dissipata connectere.

Et quamquam in libellis floris excursoriis dictis conficiendis parvi interest utrum more Jordaniano subvarietates ad speciei dignitatem perducamus, an sequentes O. Kuntze sexcentas species aliorum auctorum ad unam redigamus: maximi momenti esse censimus in plantarum distributione investiganda et ad doctrinam transmutationum aliasque quaestiones physiologicas recte intelligendas non seiungere ea quae gradatim transeuntia unum in alterum natura sint iuncta. Itaque in his disputationibus speciem statuimus esse universitatem omnium stirpium quae, quamvis extremae inter se differant habitu, magnitudine, indumento, partium figura, aliisque notis, ita formis mediis copulatae connexaeque sunt

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ut discrimen quod in omnes partes valeat nullum reperiri possit. Sed quoniam summam alicuius speciei cognitionem non possumus consequi, nisi eius varietates scientia complectamur earumque affinitates indagemus; cumque investigatio variationum multum habeat delectationis: subspecies, varietates, subvarietatesque Ranunculacearum indicarum nobis investigandas putavimus. Vis autem et natura subspeciei et varietatis in eo est quod quibusdam notis satis distinctae sint, sed tamen quasi gradibus nec genere inter se differant, ita ut discrimen varietatum propinquarum saepe perdifficile sit neque sine comparatione multorum exemplarium in herbariis conservatorum instituta possit fieri.

Atque in his commentariis nobis saepe mentio facienda erit catervarum stirpium quae, perductae ab auctoribus quibusdam ad speciei dignitatem, ad subspecies vel varietates revocandae videantur. Sed temporis spatiique compendii faciendi causa interdum licebit subspecies vel ipsas varietates tractare tamquam species, si auctores quidem iis speciei nomen invenerint. Si autem dignitatem subspeciei vel varietatis plane praedicare volumus, hoc modo scribere liceat: si speciem ab auctore quodam definitam pro subspeciem habendam censimus virgulis utemur et scribemus exempli gratia—Aquilegia fragrans' *Bentham;* si varietatem—Aquilegia fragrans" *Bentham;* si autem ipse, qui nomen dedit formae quam subspeciem opinamur esse, eam pro subspecie varietateve habuit, hoc modo scribemus exempli causa—Clematis sikkimensis *H f. et T.*' Et cum clarissimo Doctore Drude* asterisco quidem uti licuerit, ita ut ponamus—Aquilegia * Moorcroftiana *Wall.*, vel Delphinium * persicum *Boiss.*, vel Thalictrum * rufum *Lecoyer* in locum Aquilegiæ vulgaris *Lin.*, subsp. Moorcroftianae (*Wall.* pro specie) vel Delphinii camptocarpi, subsp. persici (*Boiss.* pro sp.), vel Thalictri punduani *Wall.*, subsp. rufi (*Lecoyer* pro sp.); sed facilius videtur esse minusque tardum virgulas scribere quam asteriscos.

Atque Baillon, vir ille assiduus et in cognitione rerum indaganda sagacissimus, multa genera ad subgenera, uti in Ranunculaceis Aconitum ad Delphinium, Caltham ad Trollium revocat. Eum si sequamur, num censimus tanta nomina mutanda et Delphinium Napellus vel Trollius palustris pro Aconito Napello vel Caltha palustri scribendum esse? Minime vero. Nam si subgeneris pro generis nomine utamur, vix unquam error nobis atque tenebrae erunt; si autem specierum permultarum nomina in alia mutemus, quanta turba erit, quanta confusio. Sic vero nonne iis qui rebus herbariis operam dent magis magisque necessitas imposita erit in synonymis solvendis ac discendis temporis abutendi et historiae opinionum atque errorum pro cognitione atque

* *Vide* Schenk, Handbuch der Botanik, vol. iii, 2.

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indagatione rerum naturae substituendae ? Neque Baillon, vir doctissimus, Aconito ad subgenus Delphinii redacto, dinumerat omnes species Aconiti sub nomine Delphinii neque nomen suum nominibus mutatis adicit. Nam satis est scribere Aconitum Napellus *Lin.* aut, si mavis, Aconitum ' Napellus *Lin.*, virgula posita post nomen subgeneris. Quid ? Si quis omnino tollat genus aliquod, aut si nomina prisca in libris antiquis indaget atque odoretur, nomenne suum nomini mutato affigat ? Imitandine sunt viri illi illustrissimi qui ipsorum nominibus scribendis nunquam fessi laboribus levioribus aeternitatem adipisci immortalitatemque sibi parere volunt et sub titulo legum conservandarum omnia miscunt atque perturbant ? Immo honorem censimus iis esse tribuendum qui in notis quibus species nova a reliquis eiusdem generis speciebus distingui possit accurate ac diligenter investigandis operam laboremque consumpserunt, neque iis qui in enumeratione stirpium quae in terra quadam crescunt conscribenda aut qui nomine generis commutato speciebus veteribus nova nomina imponunt. Itaque sufficet scribere—Ranunculus Shaftoanus *Aitch. et Hemsl.* (sub Oxygraphide), vel, si placet, uti nos in his disputationibus interdum scribemus,—Ranunculus ! Shaftoanus *Aitch. et Hemsl.* vel plane Ranunculus Shaftoanus *Aitch. et Hemsl.* neque Ranunculus Shaftoanus *Boiss.* Et scribere quidem maluissemus —Ranunculus Shaftoanus (*Aitch. et Hemsl.*), nisi *Torrey et Gray* in Flora civitatum boreali-americanarum nomen auctoris nominis speciei inter arcus posuissent neque scripsissent exempli causa—Caltha palustris (*Lin.*) vel Trollius laxus (*Salisb.*).

Sed ad propositum revertamur. In disputatione prima de Aquilegia dicemus fusius, quod magna in herbariis Aquilegiarum indicarum videtur esse confusio ; in altera omnes species indicas ordinis Ranunculacearum in subspecies et varietates disponere easque accuratius definire conabimur, ac praecepta addemus concisa ad species in provinciis nonnullis indicis gignentes ratione ac via determinandas ; in postrema denique de variatione atque polymorphismo Ranunculacearum quae in imperio indico regionibusque finitimis nascuntur proponere instituimus.

Materiam autem ad has disputationes conscribendas praebuerunt herbaria hortorum calcuttensis et saharanpurensis, thesauri illi ditissimi stirpium indicarum exsiccatarum, quarum usum debui benignitati liberalitatique Doctorum King et Prain, ac comitati cl. Duthiei qui non solum Ranunculaceas in herbario saharanpurensi conditas mihi libentissime et, propter studia mea frequenter negotiis publicis longo intervallo intermissa, per longum temporis spatium incommodo suo commodavit, sed cuius exemplaria exsiccata etiam ab ipso magna cura ac diligentia lecta optimeque conservata investigationum labores mearum aliquanto sublevaverunt.

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Nominum autem compendia quibus in his commentariis utemur inter alia haec sunt :—

F. I. = Flora indica; F. B. I. = Flora of British India; H. E. I. C. = herbarium of the late East India Company; H. Calc. = herbarium calcuttense; H. Sah. = herbarium saharanpurense; A. = Dr. Anderson; Aitch. = Dr. Aitchison; B. = Dr. Brandis; B. P. = Baden-Powell; C. = General Collett; Cl. = C. B. Clarke; D. = Duthie; Dd. = Davidson; Dr. = Drummond; E. = Ellis; G. = Dr. Giles; J. = Rev. Jaeschke; K. = Dr. King; K. C. = viri qui missi sunt a doctore King stirpes legendi causa; Scz. = Dr. Stoliczka; Sy. = Dr. Scully; W. = Dr. Watt.

## DISPUTATIO PRIMA.

### De Aquilegia.

Inter genera variabilia Ranunculacearum ac polymorpha vix aliud genus inveniri potest de quo tam variae sint sententiae virorum rerum herbariarum peritorum tamque discrepantes quam sunt de Aquilegiis, quarum nonnulli dinumerant plus quadraginta species, quas alii ad quinque vel sex redigendas esse censent. Atque Hooker filius et T. Thomson in Flora indica et in Flora imperii indici omnes formas indicas ad Aquilegiam vulgarem revocant, et Aquilegiam pyrenaicam, Moorcroftianam, fragrantem, pubiflorum, glandulosam, aliasque cum Aquilegia vulgari formis mediis connexas esse et ad eam reducendas affirmant, quamquam plurimi qui quidem in artis herbariae cognitione versentur illas species omnes inter se maxime distinctas et certe ab Aquilegia vulgari seiungendas esse arbitrantur. Quamobrem ad omnes formas Aquilegiarum, europaeas, sibiricas, caucasicas, americanas, praecipue autem indicas et sinenses perscrutandas nos conferre constituimus, ut reperiamus, si id fieri possit, quae notae constantes et ad species discernendas aptae evadant quaeque sint mutabiles neque ad species propinquas separandas valeant. Sed ne revolvamur eodem in hac quaestione tractanda, antequam formas varias denuo in species aut subspecies varietatesve distribuimus, species ita accipiemus uti sunt definitae in monographiis Bakeri et Zimmeteri vel in Floris orientali Boissieri, rossica, altaica, dahurica, tangutica, mongolica, aliisque auctorum rossicorum, vel in germanicis, italicis, gallicis Kochii, Bertolonii, aliorumque scriptorum.

Si autem quaerimus quibus notis ii qui de Aquilegiis scripserint ad harum species internoscendas in monographiis et floris usi sint, animadvertimus auctores indumento, thallomatis ramificationi, foliolorumque figurae ac magnitudini, partium floralium formae et mensurae comparatae vel per se aestimatae, denique folliculorum longitudini et fabricae, seminumque structurae vim discriminis adiudicavisse.

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Primum igitur de indumento pauca dicamus. Nam species Aquilegiae saepe ab auctoribus distingui invenimus praesentia aut absentia pilorum glandulosorum. Atque mirum quanta confusio exstiterit ex specie illa Gouani, quam auctor propter indumenti naturam Aquilegiam viscosam nominavit, quod nomen doctissimum Boissierum aliosque induxit ut stirpem Gouanianam ab Aquilegia vulgari typica nullo modo diversam, tabulam autem pictam in Illustrationibus male descriptam esse censerent; Kitaibel vero stirpem eam, cui postea Schott Aquilegiam Kitaibelii dixit nomen, eandem esse vult ac speciem Gouanianam, quam quidem Zimmeter cum dubio ad Aquilegiam Einseleanam refert. Baker vero in monographia sua Aquilegiarum* Aquilegiam viscosam speciem bonam neque cum varietate aliqua viscosa Aquilegiae vulgaris neque cum Aq. Einseleana confundendam esse putat. At vero exemplar vidimus humile uniflorum a Requieno in monte Ventoux Provinciae lectum, cuius folia omnibus notis ita cum foliis in tabula Gouaniana pictis congruunt ut nobis persuasissimum sit hanc esse formam quam Gouanius dicit humilem esse atque unifloram. Exemplar autem Requieni omnino cum exemplaribus quibusdam A. Einseleanae e valle Sassina Savoyensi allatis convenit, ut nemini dubium possit esse, quin A. viscosa *Gouan* eadem species sit atque A. Einseleana *Schulz* = A. pyrenaica *Koch* = A. Bauhini *Schott*, quae quidem transitus praebet ad Aquilegiam Kitaibelii *Schott* = A. viscosam *Kitaibel* = A. pyrenaicam *Visiani* et A. thalictrifoliam, quam Nyman sub-speciem censet esse A. Bauhini. De sententia Bakeri et Zimmeteri pars inferior caulis foliaque A. Einseleanae glabra sunt, sed in exemplaribus nonnullis, neque tamen omnibus, in valle Sassina lectis caulis totus petioli petioluli foliaque basilaria manifesto glanduloso-hirta sunt, ita ut discrimen inter A. viscosam et A. Einseleanam reperiri possit nullum. Iam vero indumentum caulis stirpium indicarum ita variabile est, ut nullius momenti ad species Aquilegiae seiungendas esse opinemur, utrum caulis totus sit pilosus an pars eius inferior glabrescat. Mentionem autem facere licet hoc loco exemplarium himalaicorum A. vulgaris var. Karelini, quorum parastemones apice hirti sunt, quod in nulla alia forma Aquilegiarum invenimus. Atque in Himalaya Tibetiae occidentalis forma quaedam A. Moorcroftianae occurrit, cuius caulis infimus petioli petioluli folia dense vel densiuscule glanduloso-hirta sunt, quamquam illae partes A. Moorcroftianae plerumque sunt modice puberulae vel omnino glabrae; et in exemplaribus A. nivalis' var. paradoxae *P. B.* vidimus caulem nunc basim versus glaberrimum nunc prope basim glanduloso-hirtum nunc totum cum petiolis dense hirsutum. Et foliola quidem A. vulgaris typicae

* Gardener's Chronicle, 1878.

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interdum sat dense pubescentia sunt, ut haec nota ad Aquilegiam Ebneri et A. vulgarem discernendas non valeat. De quo concludendum esse censimus indumentum caulis foliorum parastemonum ad species Aquilegiarum internoscendas nullam vim discriminis habere. Meliores vero notas praebet indumentum carpellorum. Nam formae plurimae, quae cum Aquilegia vulgari et A. canadensi artioribus affinitatis vinculis coniunctae sunt, ovarium habent dense hirtum, cum carpella Aquilegiae sibiricae glabrae sint; vidimus tamen pistilla Aquilegiae sibiricae secundum suturam ventralem pube minuta vestita, et ovaria Aquilegiae brevistylae nunc pubescentia nunc glaberrima inveniuntur. Atque carpella Aquilegiae leptoceratis a Turczaninowo glaberrima dicta sunt; sed Ledebour in Flora rossica exemplaria se vidisse ab ipso Turczaninowo missa, quorum carpella pubescenti-villosa fuerint, et stirpes in horto Schweitzingensi e seminibus sibiricis ortas ovaria pubescentia praebuisse scribit. Probabile autem, carpella iuniora hirta esse, sed cum maturescant, pubem fundere, ut interdum fere accidit in aliis Aquilegiis, sicut in A. pubiflora.

Nunc veniamus ad staturam et ramificationem caulis foliorumque divisionem. Longitudo caulis floriferi Aquilegiae glandulosae variat inter 12 et 40 cm., Aquilegiae kunaorensis et Aquilegiae pubiflorae inter 15 et 70 cm., Aquilegiae oxysepalae inter 20 et 100 cm., Aquilegiae vulgaris typicae inter 35 et 120 cm. Cum autem caulis ramique cuncti in floribus desinant, videamus quot flores in quarundam caule Aquilegiarum inveniantur. Habemus in A. vulgari typica 3-6-12, in A. nigricanti 1-5, in A. glandulosa 1-5, in A. kunaorensi 1-6, in A. oxysepala, canadensi, Einseleana 1-10; atque exemplaria reperiuntur Aquilegiae pubiflorae alia humilia et uniflora quae stirpes simplices Aquiligiae viscosae Gouanii in mentem revocant, alia procera 50-70 cm. altitudine octo vel decem flores edentia Aquilegiaeque vulgari simillima. Ramificatio igitur caulis valde varia.

Nec foliorum divisio videtur satis constare. Nam folia basilaria ternata Aquilegiae leptoceratis *Fisch. et Mey.* et Aquilegiae dinaricae *Beck* foliis biternatis plus minus mixta sunt, et folia plerumque biternata Aquilegiae Bertolonii, A. viscosae, A. pyrenaicae, A. nivalis, A. nigricantis haud raro cum ternatis nonnullis sunt sociata; quin etiam folia simpliciter ternata in A. pubiflora et A. alpina, speciebus foliis insigniter biternatis vel triternatis, haud semper absunt.

Atque foliola media in formis indicis saepius plus minusve profunde divisa, aut in A. fragranti, A. kunaorensi, A. vulgari var. Karelini folia plane triternata sunt; sed foliola terminalia A. vulgaris typicae et A. canadensis et A. glandulosae nunc ad basim usque trisecta, nunc ad medium tripartita, nunc vix ad quartam partem triloba. Species

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autem Aquilegiarum nonnullas ab auctoribus magnitudine foliolorum distinctas invenimus; et formae inter se distantes certe foliorum mensura interdum discerni possunt, uti A. pyrenaica ab A. grata; sed foliola plerumque magnitudine mirum in modum variant. Longitudo enim foliolorum mediorum foliorum basilarium Aquilegiae nivalis 3-16 mm., A. viscosae 5-25 mm., A. glandulosae 10-40 mm., A. alpinae 12-40 mm., A. pubiflorae 10-45 mm., A. vulgaris var. variae 25-50 mm., A. Moorcroftianae 9-50 mm., A. canadensis 12-50 mm., A. oxysepalae 15-60 mm.

Latitudo quoque foliolorum cum longitudine comparata nobis in discrimine specierum saepe deest, quod videre licet si, mensura acta, latitudimem folioli terminalis cum longitudine comparemus. Quam ob rem in hac tabella mensuram latitudinis tanquam fracturam longitudinis expressimus:—

| | |
|---|---|
| A. oxysepala ... ... ... | $\frac{4}{5}-\frac{10}{7}$, |
| A. vulgaris typ... ... ... | $\frac{2}{1}-\frac{4}{3}$, |
| A. alpina ... ... ... | $\frac{1}{1}-\frac{5}{4}$, |
| A. Bertolonii ... ... ... | $\frac{1}{1}-\frac{2}{3}$, |
| A. Einseleana ... ... ... | $\frac{2}{4}-\frac{1}{1}$, |
| A. pyrenaica ... ... ... | $\frac{1}{1}-\frac{2}{3}$, |
| A. nivalis ... ... ... | $\frac{1}{1}-\frac{2}{3}$, |
| A. glandulosa ... ... ... | $\frac{6}{7}-\frac{2}{3}$, |
| A. Moorcroftiana ... ... | $\frac{1}{1}-\frac{2}{3}$, |
| A. pubiflora ... ... ... | $\frac{2}{4}-\frac{4}{3}$ (raro $\frac{2}{3}$). |

Aquilegia Einseleana igitur ab A. pyrenaica et A. Bertolonii latitudine foliolorum cum longitudine comparata aegre distinguitur. Mensurae autem inter se comparatae foliolorum figuram partis eorum basim spectantis afficiunt efficiuntque ut foliola margine sese obtegant vel attingant aut intervallo plus minusve manifesto inter se distent. Et foliola quidem terminalia foliorum basilarium basim versus conspicue cuneata sunt in A. thalictrifolia et A. Einseleana et A. leptocerate, late cuneata in A. Kitaibelii, A. Bertolonii, A. oxysepala, aliisque; sed in A. vulgari typica nunc subanguste nunc late cuneata nunc fere rotundata, in A. alpina basi aut obtusa subcuneata aut subtruncata, in A. pyrenaica late cuneata v. subcordata v. rotundato-truncata, in A. nivali obtusa v. subcordata, raro cuneata, in A. glandulosa et Moorcroftiana late cuneata v. obscure cordata v. truncata, in A. pubiflora late cuneata v. subtruncata. Foliola marginibus plus minusve sese obtegunt in A. alpina, A. Bertolonii, A. pyrenaica, A. nivali, A. grata; in A. glandulosa foliola marginibus plerumque imbricata sed etiam subdistantia, quod accidit etiam in A. Moorcroftiana, A. vulgari, A. oxysepala, A. pubiflora; cum foliola A. Einseleanae et thalictrifoliae semper distantia

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sint et in A. Kitaibelii sese vix attingant. Transitus vero animadvertuntur inter A. Einseleanam et A. Bertolonii; neque A. thalictrifolia cum A. grata et A. pyrenaica gradibus per A. Einseleanam et A. Kitaibelii non est connexa. Inter Aquilegias autem indicas A. pubiflora varietatibus foliorum insignis; folia enim nunc Aquilegiae vulgaris, nunc Aquilegiae alpinae, nunc fere Aquilegiae viscosae.

Sed haec quidem de foliis basilaribus: folia autem caulina inferiora A. Moorcroftianae, praesertim eius varietatis, quam Cambessède suaveolentem appellavit, mirifice polymorpha nunc Aquilegiam vulgarem, nunc A. glandulosam, nunc A. alpinam, nunc A. Bertolonii in mentem revocant; et in exemplaribus afghanicis et kashmiricis ex eodem loco allatis nunc crenas breves et rotundatas A. Bertolonii vel pyrenaicae nunc lineari-ablongas A. alpinae animadvertimus; neque folium caulinum infimum A. Bertolonii basilaribus semper dissimile, et stirpes Aquilegiae alpinae floribus magnis haud raro occurrunt quae foliorum caulinorum natura inferiorum ab Aquilegia Bertolonii aegre discernuntur.

Mittimus vero de florum colore dicere: notissima enim mira varietas illa colorum quam vidimus in gregibus illis americanis Aquilegiae caeruleae et formosae; notissimae etiam varietates florum Aquilegiae glandulosae quae sepalis caeruleis petala nunc alba, nunc ochroleuca, nunc caerulea adiungit; notissimae denique in saltibus himalaicis stirpes illae Aquilegiae kunaorensis suaveolentis speciosis ornatae floribus ex calyce albido constantibus vel stramineo et corona, cui suffusus est color nunc ochroleucus, nunc albus, nunc violaceus.

Verum haec missa facimus; illud quaeramus num magnitudo florum discrimen sit inter species Aquilegiarum. Hac enim nota auctores saepe usi sunt ad Aquilegiam vulgarem et A. nigricantem, A. Bertolonii pyrenaicamque et A. alpinam, A. Kitaibelii et A. pyrenaicam et A. Einseleanam, A. vulgarem et A. Ebneri, A. longisepalam et A. nigricantem, A. Moorcroftianam et A. fragrantem internoscendas. Longitudinem vero sepalorum, quae nota ad magnitudinem floris attinet, in exemplaribus herbariorum indicorum, millimetris mensam, hanc reperimus—in:—

| | | | | |
|---|---|---|---|---|
| A. vulgari | ... | ... | 18–32, | |
| A. atrata | ... | ... | 18–32, | |
| A. nigricanti | | ... | ... | 27–34, |
| A. alpina | ... | ... | ... | 30–45 (rarissime minus 30), |
| A. Einseleana | | ... | ... | 14–27, |
| A. Bertolonii | | ... | ... | 24–30, |
| A. glandulosa | | ... | ... | 16–45, |
| A. nivali | ... | ... | ... | 14–28, |



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| | |
|---|---|
| A. kunaorensi var. α Camb. | ... 14–24, |
| A. kunaorensi suaveolenti | ... 26–50, |
| A. oxysepala ... | ... 17–30, |
| A. pubiflora ... | ... 12–28, |
| A. fragranti ... | ... 22–30, |
| A. pyrenaica typica ... | ... 17–27, |
| A. canadensi ... | ... 12–22, |
| A. caerulea ... | ... 22–40. |

Distributio igitur Aquilegiarum in micranthas, mesanthas, macranthas vix hortulanis quidem usui esse potest; neque mensura sepalorum utenda videtur in discrimine A. Ebneri et A. vulgaris, A. vulgaris genuinae et A. nigricantis. Et quamquam Zimmeter in tabella analytica scribit sepala A. Kitaibelii esse 17 mm., Aquilegiae autem Einseleanae et pyrenaicae 25–27 mm. longa, vidimus tamen exemplaria Aquilegiae Einseleanae in alpibus savoyensibus lecta quorum sepala 14–18 mm. tantum longa erant, et specimina reperimus Aquilegiae pyrenaicae e saltibus montis pyrenaei allata sepalis vix plus 17 mm. longis. Non est igitur vis discriminis in longitudine sepalorum. Melius autem insigne ad species discernendas mensurae sepalorum inter se comparatae praebere videntur; nam sepala exemplarium fere omnium Aquilegiae pubiflorae et Aquilegiae oxysepalae lanceolata et manifesto, interdum longissime, acuminata sunt; vidimus autem specimina A. pubiflorae sepalis aut ovato-lanceolatis longe acuminatis apice acutis aut obtusis, aut ovato-lanceolatis leviter acuminatis apice subacutis aut raro ovato-oblongis neque acuminatis apice obtusis, aut rarissime late ovatis apice obtusis. In hac tabella latitudo sepalorum tanquam fractura longitudinis expressa est—

| | |
|---|---|
| A. pyrenaica genuina ... | ... $\frac{1}{2}$–$\frac{3}{5}$, |
| A. Einseleana ... ... | ... $\frac{2}{5}$–$\frac{5}{9}$, |
| A. vulgaris typica ... ... | ... $\frac{1}{3}$–$\frac{2}{3}$, |
| A. glandulosa ... ... | ... $\frac{2}{5}$–$\frac{3}{5}$, |
| A. moorcroftiana typica ... | ... $\frac{1}{3}$–$\frac{5}{9}$, |
| A. kunaorensis suaveolens ... | ... $\frac{1}{3}$–$\frac{2}{3}$, |
| A. oxysepala ... ... ... | ... $\frac{1}{3}$–$\frac{2}{5}$, |
| A. pubiflora ... ... ... | ... $\frac{1}{7}$–$\frac{1}{3}$, raro $\frac{1}{2}$. |

Reperiuntur autem sepala Aquilegiae moorcroftianae typicae nunc late ovata v. ovato-oblonga apice obtusissima aut subacuta, nunc ovato-lanceolata breviter acuminata apice obtusiuscula; sepala Aquilegiae kunaorensis var. suaveolentis nunc ovato-oblonga neque acuminata sed apice acutiuscula aut breviter acuminata apiceque fere obtusa, nunc ovato-lanceolata acutissima conspicueque acuminata; sepala Aquilegiae alpinae nunc late ovata acuta nunc elliptico-oblonga subobtusa. Sunt

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igitur, quoad sepala, formae mediae inter A. pubifloram et A. vulgarem typicam, neque e sepala A. oxysepalae latiora sepalis Aquilegiae vulgaris var. indica figura dissimilia.

Alia nota quam auctores ad species seiungendas aptam existimant a longitudine sepalorum et petaloram comparata sumpta est, uti sepala A. Einseleanae dicuntur petalorum limbum superare 14 mm., A. pyrenaicae 9 mm., A. nigricantis 21 mm.; eminere vero videmus sepala ultra petalorum marginem anteriorem 3–14 mm. in A. Einseleana, 4–9 mm. in A. pyrenaica, 10–21 mm. in A. nigricanti; in Aquilegia porro pubiflora 6–14 mm., in A. Moorcroftiana typica 3·5–12 mm., in A. oxysepala 4–11 mm., in A. kunaorensi suaveolenti 15-22 mm., in A. nivali 7–14 mm., in A. glandulosa typica 6–22 mm., in A. viridiflora interdum 0–4 mm.

Nec mensurae comparatae limbi petalorum longiorumque staminum nobis ad species seiungendus suppetunt. Neque columnam stamineam A. atratae nunquam extra petalorum campanulam 3 mm. tantum proiectam vidimus, quod etiam accidit in A. vulgari typica; in A. Einseleana autem et in A. alpina stamina petalis sunt 2–6 mm., in A. pyrenaica 2–4 mm., in A. glandulosa 2–11 mm. breviora, cum in aliis stamina nunc sint petalis paullulo breviora nunc paullulo longiora. In Aquilegia vero caerulea var. typica stamina nectariorum limbo nunc 10 mm. breviora nunc 6 mm. longiora, nunc numerosissima nunc eodem fere numero atque in A. canadensi, nunc patentissima nunc subparallela, nunc fere eadem longitudine nunc inter se valde inaequalia.

Proximum est ut de forma laminae petalorum investigemus utrum satis constet ad discrimen specierum an variabilis evadat. Margo autem exterior petalorum manifesto rotundatus reperitur in A. transsilvanica, glandulosa, iucunda, Einseleana, thalictrifolia, Bertolonii, pubiflora; rotundato-truncatus est in A vulgari, atrata, alpina, glauca, nivali, fragranti, Moorcroftiana, formosa, canadensi, Skinneri. Vidimus tamen exemplaria A. pyrenaicae typicae et A. Einseleanae et A. pubiflorae quorum petala apice rotundato-truncata erant neque plane rotundata; Aquilegia autem glandulosa genuina Fischeri petala habet apice obtusa; et petala Aquilegiae nivalis nunc fere rotundata, nunc truncata ac sinuata, nunc profunde emarginata sunt. Figura igitur limbi petalorum, quamquam satis utilis ad subspecies internoscendas, nos in specierum discrimine fallere videtur.

Maximi vero momenti auctores plurimi calcaris formam magnitudinemque comparatam esse putaverunt.

Primum igitur de mensura calcaris cum laminae longitudine comparata videamus. Neque tamen de formis illis monstrosis Aquilegiae vulgaris ecalcaratis agemus, neque de varietate illa Aquilegiae formosae cui nomen truncatam dicunt disseremus cuius calcar longitudine vix

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quinta decima vel vigesima pars est petalorum limbi, quae varietas vero cum forma illa calcaribus lamina quadruplo longioribus praedita et a Fischero sub nomine Aquilegiae formosae definita gradibus connexa est; cum A. formosa Fischeri sensim in stirpem illam, quae a Planchon arctica dicitur et in tabula picta* lineis descripta est, transeat. Sed formis Aquilegiae vulgari affinibus nos contineamus. Mensuram autem calcaris ad longitudinem laminae redactam ita reperimus—

| | | | | |
|---|---|---|---|---|
| A. vulgaris typica | ... | ... | ... | $\frac{1}{1-\frac{3}{4}}$, |
| A. pyrenaeica typica | ... | ... | ... | $\frac{3}{4-\frac{3}{4}}$, |
| A. Einseleana | ... | ... | ... | $\frac{2}{3-\frac{1}{1}}$, |
| A. Moorcroftiana typica | | ... | ... | $\frac{1}{1-\frac{2}{1}}$, |
| A. kunaorensis suaveolens | | ... | ... | $\frac{2}{3-\frac{2}{2}}$, |
| A. glandulosa (incl. iucunda) | | ... | ... | $\frac{1}{4-\frac{1}{1}}$, |
| A. fragrans | ... | ... | ... | $\frac{2}{3-\frac{1}{1}}$, |
| A. pubiflora | ... | ... | ... | $\frac{5}{12-\frac{1}{1}}$, |

Haec nota igitur nequaquam constat.

Sequitur ut de forma calcaris quaeramus. Calcar vero utrum rectissimum sit an modice incurvum nihil interest ad species internoscendas. Nam calcar nunc rectum nunc manifesto incurvum neque tamen hamatum reperitur in A. Einseleana, Kitaibelii, thalictrifolia, Ottonis, leptocerate, Moorcroftiana, glauca, kunaorensi suaveolenti, pyrenaica. Tabula picta vero Aquilegiae viridiflorae in Iconibus Delessertii ab auctoribus iterum iterumque reprehensa et male descripta existimata est quippe quae calcaria exhibeat apice incurva; vidimus tamen exemplaria mongolica a Potanino lecta calcaribus vertice manifesto curvatis minimeque rectis. Haec observatio nos incitat ad quaestionem investigandam num figura calcaris tanti momenti ad species distinguendas sit quanti eam auctores, perpaucis exceptis, esse crediderint. Calcaria Aquilegiae Moorcroftianae in alabastro saepe uncinatim incurva; cum stirps floreat, nunc stricta, nunc manifesto incurva ac calcaribus Aquilegiae nigricantis vix rectiora. Meliora vero exempla variationis calcarium ex Aquilegia pubiflora, fragranti, nivali ducere possumus. Nam Aquilegiae pubiflorae calcaria reperimus saepissime uncinatim vel circinnatim incurva; in silvis tamen provinciae Simla forma occurrit sepalis quidem lanceolatis acuminatis foliisque Aquilegiae pubiflorae genuinae sed calcare nunc manifesto uncinato nunc leniter incurvo minimeque hamato; et in varietate, quae Cunningham ex Himalaya pentapotamica attulit, calcar paullum incurvum sepalis nunc lanceolatis acuminatis nunc late ovatis obtusis adiunctum est. Vidimus etiam in herbario Kurzii exempla e Bavaria missa

* Flore des Serres, tab. 795.

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Aquilegiae vulgaris genuinae calcaribus rectis nequaquam hamatis; et calcaria Aquilegiae alpinae, vix unquam recta, in Appennino septentrionali fere more Aquilegiae vulgaris incurva inveniuntur, stirpes vero foliis Aquilegiae alpinae typicae instructae sunt neque cum Aquilegia Bertolonii confundendae. Sed ad species himalaicas revertamur. Sunt in terra gilgitensi et in Kashmiria stirpes caule elato insigniter folioso foliis valde divisis atque haud raro triternatis floribusque mediocribus affinitate artissima inter se iunctae; sed calcaria nunc perbrevia et circinnatim incurva Aquilegiae glandulosae, nunc lamina paullo breviora et manifesto incurva, uti haud raro sunt in Aquilegia Einseleana, nunc subrecta et lamina sublongiora Aquilegiae Moorcroftianae typicae. Neque forma illa, quae in montibus altissimis ad nivem deliquescentem nascitur et cui, auctore Bakero, Aquilegiam nivalem nomen dedit Falconer, variatione calcaris minus insignis; stirpes sunt humiles, foliis biternatis, foliolis margine sese obtegentibus reniformibus vel late rotundato-deltoideis, floribus saepius mediocribus, sepalis caeruleis vel violaceis, carpellis quinque, atque omnibus notis, calcaribus exceptis, ita inter se congruunt ut ne in varietates quidem divelli possint. Flores vero plurimi calcar habent crassiuscule conicum et vix incurvum formarum quarundam Aquilegiae alpinae; reliquorum autem calcaria nunc graciliora atque omnino Aquilegiae pyrenaicae, nunc brevia et circinnatim involuta uti in Aquilegia glandulosa; haec est forma cuius Hooker filius et Thomson in Flora imperii indici nomine Aquilegiae iucundae mentionem faciunt, neque revera ab Aquilegia iucunda Fischeri distinguenda est nisi petalorum lamina truncata vel emarginata nec rotundata staminibusque saepius limbum subaequantibus. Quibus rebus expositis satis docuisse videmur calcarium figuram ad species indicas discernendas parvi momenti esse.

Jam vero parastemones propter eorum varietatem praetermittamus. Sed de carpellis pauca dicenda esse putamus. Pistilla autem staminibus longioribus 1–5 mm. breviora vel 4 mm. longiora in A pubiflora, 2 mm. breviora vel 3 mm. longiora in A. kunaorensi suaveolenti, 4 mm. longiora vel 1 mm. breviora in A. nivali, 1 mm. longiora breviorave in A. oxysepala, 2 mm. longiora vel 3 mm. breviora in A. Moorcroftiana, 1–5 mm. breviora vel fere 1 mm. longiora in A. alpina. Parvi igitur interest utrum stylus ultra stamina emineat an a staminibus superetur.

Styli autem primum saepissime recti, sed pollen postquam ventorum insectorumque ope dispersum est, parte stigmatosa saepissime paullum dilatata, apex styli haud raro plus minusve manifesto recurvatur. Occurrunt styli apice recti ac plus minusve recurvi nec raro fere revoluti in Aquilegia nivali, vulgari, fragranti, et stylus Aquilegiae pubiflorae et Moorcroftianae nunc rectus nunc apice circinnatim curvatus invenitur.

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Sed quoniam de carpellis, qualia sunt ante coniunctionem pollinis cum ovulis factam, insignia ad species distinguendas trahere non possumus, videamus num liceat notas ad discrimen utiles de carpellis maturis ducere. Et certe formae quaedam ab aliis quibusdam longitudine folliculorum discerni possunt, uti Aquilegia Skinneri, cuius carpella matura inter Aquilegiis longissima et fere 3·5 cm. longa distinctionem huius speciei et Aquilegiae canadensis reddunt facillimam. Sed primum demus enumerationem longitudinum folliculorum, sequentes monographiam Bakeri et pollicis mensuram in millimetra commutantes :—

| | |
|---|---|
| A. Einseleana ... ... | 8–13 mm. |
| A. viscosa ... ... | ... 13 mm. |
| A. thalictrifolia ... ... | vix 13 mm. |
| A. pyrenaica ... ... | ... 13 mm. |
| A. Bertolonii ... ... | ... 13 mm. |
| A. Amaliae ... ... | fere 13 mm. |
| A. pubiflora ... ... | 12–16 mm. |
| A. viridiflora ... ... | 12–19 mm. |
| A. brevistyla ... ... | ... 13 mm. |
| A. flavescens ... ... | 12–19 mm. |
| A. Moorcroftiana ... | 15–19 mm. |
| A. glauca ... ... | ... 19 mm. |
| A. canadensis ... ... | fere 19 mm. |
| A. fragrans ... ... | 18–25 mm. |
| A. parviflora ... ... | ad 25 mm. |
| A. leptoceras ... ... | fere 25 mm. |
| A. vulgaris ... ... | fere 25 mm. |
| A. sibirica ... ... | fere 25 mm. |
| A. formosa ... ... | vix 25 mm. |
| A. chrysantha ... ... | fere 25 mm. |
| A. glandulosa ... ... | fere 25 mm. |
| A. caerulea ... ... | plus 24 mm. |
| A. alpina ... ... | 25–30 mm. |
| A. Skinneri ... ... | ... 35 mm. |

Verum fieri potest ut, maiore stirpium fructiferarum copia perscrutata quam fere in herbariis inveniatur, magnitudo carpellorum magis variabilis reperiatur quam appareat ex illa tabella. Nam folliculi exemplarium quorundam sinensium Aquilegiae oxysepalae 16–18 mm. sed in mandshuricis sunt 26 mm. longi; et carpella matura A. pubiflorae et A. Moorcroftianae, illa 13–21 mm., haec 15–22 mm. longa animadvertimus.

Atque folliculi Aquilegiae pubiflorae saepissime sunt a medio valde recurvati uti in A. olympica; sed exemplaria etiam indica suppetunt,

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quorum folliculi recti et paralleli sunt, ut in A. oxysepala et A. caucasica.

Quid igitur est? Nonne videmus omnia signa, quae ii, qui rerum herbariarum europearum periti sunt, ad discrimen specierum generis Aquilegiae adhibuerint, in stirpibus himalaicis et sinensibus fluxa esse atque omnino cadere? Nonne videmus Aquilegiam fragrantem, uti gradatim in Aquilegiam Moorcroftianam et Aquilegiam kunaorensem suaveolentem transit, ita cum Aquilegia pubiflora artissimis affinitatum vinculis coniunctam esse? Nonne videmus formam illam raram et speciosam in iugis provinciae Garhwal ortam, quae ab Aquilegia alpina morphologice certe non seiungenda est, nihil aliud esse nisi varietatem Aquilegiae kunaorensis? Nonne videmus Aquilegiam nivalem quae ipsa, et recte quidem, a Bakero varietas Aquilegiae glaucae, id est Moorcroftianae existimatur, non solum Aquilegiam pyrenaicam omnibus rebus imitari, sed etiam Aquilegiae iucundae quam proxime appropinquare? Nonne verisimile est stirpes illas quae in valle Nila una cum Aquilegiae pubiflorae stirpibus crescunt, sed propter figuram calcarium indumentumque caulis atque foliorum ad varietatem Karelini Aquilegiae vulgaris referendae sunt, nihil aliud esse nisi formas Aquilegiae pubiflorae, quae, quasi atavismo, ut ita dicam, ad parentem Aquilegiam vulgarem spectent? Si vero folia, calcaria, fructus, reliquae denique partes stirpium himalaicarum atque sinensium ita variabilia evadant, ut eandem varietatem floribus nunc Aquilegiae pyrenaicae, nunc Aquilegiae iucundae, nunc Aqnilegiae alpinae ornatam inveniamus, nonne notae, quibus A. Einseleana, Bertolonii, nigricans, discolor, Ebneri, atrata, aliaeque internoscuntur, nimis viles ad species discernendas videantur? Cognitio igitur varietatum Aquilegiarum indicarum ac sinensium nos in eandem sententiam adducit, ad quam abhinc multos annos* Hooker filius et Thomson scrutatione specierum europaearum aliarumque perducti fuerunt: Aquilegiam vulgarem, alpinam, glandulosam, viscosam, pyrenaicam, Moorcroftianam, pubifloram, aliasque complures speciem unam efficere, insigniter quidem variabilem et propter formas plures in propinquas sensim sensimque transeuntes aegre in subspecies ac varietates distribuendam. Sed quoniam multas species ad unam redigendas esse demonstravimus, formas cunctas quas ab Aquilegia vulgari non seiungendas esse putamus enumerare oportet. Sunt autem haec—

A. alpina *Lin.*
A. Amaliae *Heldr.*
A. atrata *Koch.*
A. kunaorensis *Camb.*
A. lactiflora *Kar. et Kir.*
A. leptoceras *Fisch. et Mey.*

* Flora Indica, p. 44, 45, (1855).

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A. aurea *Janka.*
A. Bauhini *Schott.*
A. Bernardi *Gren.*
A. Bertolonii *Schott.*
A. caucasica *Rupr.*
A. dinarica *Beck.*
A. discolor *Lev. et Ler.*
A. Ebneri *Zimtr.*
A. Einseleana *Schulz.*
A. fragrans *Benth.*
A. Fussii *Zimtr.*
A. Gebleri *Besser.*
A. glandulosa *Fischer.*
A. glauca *Linell.*
A. grata *Maly.*
A. iucunda *Fischer.*
A. Kitaibelii *Schott.*
A. longisepala *Zimtr.*
A. Moorcroftiana *Wall.*
A. nevadensis *Boiss.*
A. nigricans *Baumgt.*
A. nivalis *Falc.*
A. olympica *Boiss.*
A. Ottonis *Orph.*
A. oxysepala *Trautv.*
A. paraplesia *Schur.*
A. pubiflora *Wall.*
A. pyrenaica *DC.*
A. Reuteri *Boiss.*
A. Sternbergii *Rchb.*
A. subalpina *Bor.*
A. sulphurea *Zimtr.*
A. transsilvanica *Schur.*
A. viscosa *Gouan.*

Hae formae ita in subspecies varietatesque disponendae videntur—

I. A. oxysepala' *Trautv.*
  α. mandshurica *P. B.*"
  β. kansuensis *P. B.*"
II. A. vulgaris' typica *Lin.*
  α. caucasica *Ledebour.*"
  β. olympica" *Boiss.*,
  γ. Bernardi" *Gren.*,
  δ. longisepala" *Zimtr.*
  ε. atrata" Koch.
  ζ. Karelini *Baker.*"
  η. varia *Maly.*"
  θ. rectıcornu *P. B.*"
  ι. Ebneri" *Zimtr.*
  κ. dinarica" *Beck.*
  λ. eynensis *P. B.*"
  μ. paraplesia" *Schur.*
  ν. nigricans" *Baumgt.*
III. A. alpina' *Lin.*
  α. typica.
  β. himalaica *P. B.*"
IV. A. Bertolonii' *Schott.*
V. A. viscosa' *Gouan.*
  α. Einseleana" *Schulz.*
  β. thalictrifolia" *Schott.*
  β. discolor" *Levier et Ler.*
VIII. A. nivalis' *Falconer.*
  α. paradoxa *P. B.*"
  β. saccocentra *P. B.*"
IX. A. glandulosa' *Fisch.*
  α. iucunda" *Fisch.*
  β. genuina.
  γ. sulphurea" *Zimtr.*
  δ. transsilvanica" *Schur.*
  ε. Gebleri" *Besser.*
X. A. Moorcroftiana' *Wall.*
  α. fragrans" *Benth.*
  β. Winterbottomiana *P. B.*"
  γ. suaveolens *Camb.*"
  δ. glauca" *Lindl.*
  ε. kunaorensis" *Camb.*
  ζ. Wallichiana" *Herb. Calc*
  η. afghanica *P. B.*"
  θ. subaphylla *P. B.*"
XI. A. leptoceras' *Fisch. et Mey.*
XII. A. lactiflora' *Kar. Kir.*
XIII. A. pubiflora' *Wall.*
  α. Cunninghami *P. B.*"
  β. Massuriensis *Royle.*"

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γ. Kitaibelii" *Schott.*
VI. A. grata' *Maly.*
VII. A. pyrenaica' *D. C.*
α. genuina.
γ. subnuda *P. B.*"
XIV. A. Ottonis' *Orph.*
α. typica.
β. Amaliae" *Heldr.*

Affinitates autem in tabula tertia exhibitae sunt.

## SUBSPECIES, VARIETATES, SUBVARIETATESQUE AQUILEGIAE VULGARIS *Linn.*

I. **Aquilegia oxysepala**' *Trautv.* (1847)

(Aquilegia vulgaris var. oxysepala *Regel* Flor. Ussur. A. oxypetala *Franchet*, Pl. Dav., Pl. Delav.),

foliis basilaribus biternatis, foliolis incisocrenatis terminali rhombeo v. cuneato-obovato, foliis caulinis sparsis, inflorescentia (1–) 2–10–flora, alabastris subcylindricis, sepalis erectopatulis lanceolatis acuminatis 17–30 mm. longis vinosobrunneis, petalis rotundato-truncatis lamina albida calcaribus laminae subaequilongis uncinatim incurvis, staminibus petalorum apicem haud attingentibus, carpellis hirtis, folliculis cylindricis sine stylo 16–26 mm. longis.

Area geographica—Sibiria orientalis, Mandshuria, China propria borealis et occidentalis.

*var.* α. **mandshurica** *P. B.*,

foliolis terminalibus foliorum basilarium 4–5 cm. longis, sepalis 27–30 mm. longis 10–12 mm. latis, parastemonibus acutissimis vix v. haud undulatis, folliculis sine stylo 25–28 mm. longis. *Mandshuria, China borealis, Siberia orientalis.*

*var.* β. **kansuensis** *P. B.*,

sepalis 15–25 mm. longis 5–7·5 mm. latis, parastemonibus oblongo-lanceolatis acutis conspicue crispule undulatis folliculis sine stylo 12–19 mm. longis. *Kansu, Hupeh, Setchwan, Yunnan.*

*subvar.* αα. inflorescentia 3–10 flora foliolis intermediis fol. bas 4–6 cm. longis. Vidi exemplaria ex *Hupeh* (*Henry*) et *Setchwan* (*Pratt*) allata.

*subvar.* ββ. inflorescentia 1–3 flora foliolis intermediis 16–25 mm. longis. *Hupeh* (*Henry !*).

### Descriptio subspeciei.

Rhizoma descendens, irregulariter cylindricum, collo reliquiis foliorum plus minusve in fibrillas solutis vestitum, atrobrunneum, caulem solitarium edens, 3–15 mm. crassitudine.

Caulis erectus simplex v. superne ramosus teres leviter sulcatus fistulosus, florifer (20–) 40–70 cm. altitudine basi 2–6 mm. crassitudine, plus minus puberulus.



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Folia basilaria longissime petiolata sed caule florifero multo breviora 12–30 cm. longa; petiolus basi in vaginam late lanceolatam margine membranaceam 5–35 mm. longam convergentim plurinerviam dilatatus leviter canaliculatus 2-20 cm. longus puberulus v. subglaber 0·8–2 mm crassitudine; lamina biternata; petioluli primarii graciles glabri v. puberuli, medio 15–70 mm. longo laterales $\frac{1}{3}$–$\frac{2}{3}$ medii longitudine; foliola membranacea viridia infra pallidiora tenuiter nervosa, terminale longe petiolulatum v. subsessile circumscriptione rhombeum v. cuneato-obovatum interdum subrotundum 15–60 mm. longum latitudine $\frac{1}{2}$–$\frac{4}{7}$ longitudinis basi late cuneatum rarius subrotundatum fere ad medium rarius ad duo partes trilobum, lobo medio obovato saepe late cuneato apice crenis grossis tribus inciso, lobis lateralibus breviter oblongis inaequaliter inciso-crenatis, petiolulo 1 cm. longo v. subnullo; foliola lateralia breviter v. saepius brevissime petiolulata v. plane sessilia trapezoidea asymmetrice lateque cuneata v. obscure semicordata ad medium v. infra medium inaequaliter biloba, lobis paucicrenatis v. intermedio plus minus profunde bilobulato.

Folia caulina intermedia sparsa sursum gradatim magnitudine decrescentia breviusque petiolata basilaribus subconformia; superiora subsessilia saepe profunde tripartita partitionibus lanceolatis, summa parva tripartita v. bracteiformia lanceolata integra.

Inflorescentia raro uniflora saepissime 2–10 flora laxissima. Pedunculi graciles longitudine varia teretes apicem versus pilis patentissimis dense pubescentes. Flores mediocres v. maiusculi suberecti. Alabastri subcylindrici.

Sepala erecto-patentia membranacea lanceolata acuminata nervis ramosis tribus percursa basi longe cuneata v. abrupte constricta apice acuta 17–30 mm. longa latitudine $\frac{1}{3}$–$\frac{1}{2}$ longitudinis, dorso parce puberula v. glabra, vinoso-brunnea, petala 5–11 millimetris superantia. Petalorum lamina oblonga apice rotundato-truncata 12–15 mm. longa, albida; calcar a basi conoidea sensim in apicem anguste subcylindricum attenuatum uncinatim incurvum (raro subrectum?) apice nectarifero subcapitatum, in flore aperto distantia inter punctum insertionis et partem infimam calcaris quam lamina 1 mm. longiore v. paullo breviore. Stamina modice numerosa apicem petalorum haud attingentia; filamenta longiora 7–10 mm. longa, lanceolato-linearia; antherae oblongae, 1–2 mm. longae, flavae v. fusco-virides-centes. Parastemones scariosi ovato-lanceolati apicem versus acutati marginibus plani v. crispule undulati 6–9 mm. longi, pistillis circiter 2 mm breviores. Pistilla 5, erecta, 9–11 mm. longa; ovaria subcylindrica, in stylum graciliter subulatum subaequilongum sensim attenuata, cum parte inferiore styli dense patentissimeque hirta. Folliculi (4–) 5 chartacei paralleli cylindrici, stylo subulato 5–6 mm. longo rostrati, venis transversis crebris plus minus anastomosantibus conspicue reticulati, hirti, sine stylo 13–26 mm. longi crassitudine $\frac{1}{8}$–$\frac{1}{7}$ longitudinis. Semina numerosa oblongo-obovoidea sectione transversa subtriangularia dorso curvata ventre carinata, circiter 2·5 mm. longa, nigra, nitida rarius subopaca, creberrime minuteque punctulata.

Aquilegia hybrida *Sims*, nisi revera forma hibrida ex A. canadensi et A. vulgari sit, quod dubium est quoad stirpes e seminibus sibiricis in horto dorpatensi natas, A. oxysepalae' foliis, colore florum, forma alabastri, sepalorum directione valde affinis videtur, et vix dubitandum quin varietas sit huius subspocei calcaribus subrectis praedita.

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## II. **Aquilegia vulgaris** *Lin.*

subspecies **typica**

(Aquilegia vulgaris subsp. I, *H. f. et T.* in F. B. I.; Aquilegia vulgaris *Zimmeter* No. 1, Baker No. 18; Aquilegia Ebneri *Zimmeter;* A. nigricans *Baumgt.*, A. Sternbergii *Rchb.*, A. Haenkeana *Koch;* A. atrata *Koch;* A. caucasica *Rupr.;* A. olympica *Boiss.;* A. paraplesia *Schur;* A. longisepala *Zimmeter;* A. dinarica *Beck;* A. subalpina *Boreau;* A. Bernardi *Gren.;* A. glaucophylla *Steud.*),

foliis basilaribus biternatis, rarissime ternatis, foliolis terminalibus cuneato-obovatis v. reniformibus rarius rhombeis, foliis caulinis sparsis magnitudine varia, inflorescentia (1–) 2–15 flora, sepalis stellatim patentibus ovatis v. ovato-lanceolatis 18–38 mm. longis, calcaribus lamina rotundato-truncata rarius obtusa paullo longioribus rarius subduplo brevioribus, staminibus petala 1–3 rarius 3–8 mm. superantibus, carpellis hirtis, folliculis e basi ovoidea apicem versus attenuatis sine stylis 18–24 mm. longis. Area geographica—Sibiria, Altai, Thian-Shan, Ferghana, Himalaya occidentalis, Caucasus, Armenia, Europa fere tota, Mons Atlas.

Varietates.

*var.* α. **caucasica** *Ledebour"*,

(A. caucasica *Rupr.*), caule 50–90 cm altitudine, ramoso folioso glanduloso-pubescenti, foliis basilaribus biternatis, foliolo medio longiuscule petiolato basi cuneato ad medium trilobo, lateralibus sessilibus v. breviter petiolulatis profunde bilobis, lobis rotundato-crenatis, foliis caulinis inferioribus basilaribus subconformibus sed brevius petiolatis, superioribus trifoliolatis foliolis bi v. trifidis v. integris, summis linearibus, floribus fere magnitudine var. typicae, sepalis cyaneis ovato-oblongis in apicem acutum acuminatis, petalorum lamina albida apice truncata, calcaribus e basi late conoidea subulatis, hamatis staminibus stylisque limbum attingentibus, folliculis parallelis, e basi ovoidea attenuatis, sine stylo circiter 2 cm. longis, seminibus nitidis microscopice punctulatis.—Caucasus.

*var.* β. **olympica**" *Boiss.*,

uti var. α, sed folliculi usque a medio divergentim recurvi et semina opaca granulata.—Armenia, Persia bor.

*var.* γ. **Bernardi**" *Grenier*,

caule 50–70 cm. altitudine superne ramoso 3–7 floro, foliis basilaribus magnis varietatis typicae (variae), sepalis late ovatis, petalorum lamina apice rotundato-truncata, calcaribus lamina subduplo brevioribus gracilibus hamatis, staminibus lamina multo brevioribus.—Corsica.

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*var.* δ. **longisepala**" *Zimmeter*,

(A. longisepala, *Zimmeter* No. 4), caule folioso 40–70 cm. altitudine superne glanduloso-pubescenti, foliis biternatis glabris viridibus, foliolis magnis (ad 50 mm. longis) cuneatis divergentibus ad quartam tertiamve partem trilobis, floribus saturate caeruleis, sepalis lanceolatis fere 38 mm. longis, petalorum lamina apice truncato-rotundata fere 1 cm. longa calcaribus lamina duplo longioribus uncinatim incurvis, staminibus laminam fere 5 millimetris superantibus.—Hungaria, Croatia.

*var.* ε. **atrata**" *Koch*,

(A. atrata *Koch*, A. nigricans *Rchb. et Zimmeter nec Baumgt.*), caule superne ramoso folioso 35–80 cm. altitudine, foliis biternatis foliolis fol. bas. subsessilibus v. saepius manifesto petiolulatis glabris v. saepius infra puberulis v. subdense pubescentibus intermedio ad quartam partem v. ultra medium 3-lobo, lobo intermedio breviter oblongo v. cuneato-obovato, floribus purpureo-violaceis rarius caeruleis, sepalis 18–32 mm. longis, petalorum lamina apice truncata raro rotundata 11–14 mm. longa, calcaribus quam lamina 2–5 mm. longioribus, staminibus in columnam subcylindricam petala (3–) 5–10 millimetris superantem associatis, stylo apice recto v. recurvo antheras saepe haud attingente, folliculis var. typicae.—Alpes, Jura, Silva bavarica, Transilvania; Thian Shan in montibus Alexandrinis ?

*var.* ξ. **Karelini** *Baker*" (A. Sternbergii ? *Kar. Kir*),

caule 60–80 cm. altitudine folioso plurifloro, uti petioli petiolulique, usque a basi dense glanduloso-hirto, foliis basilaribus aut biternatis foliolisque ad medium v. magis profunde tripartitis aut plane triternatis, foliolis tenuiter membranaceis puberulis, crenaturis obtusis, foliis caulinis inferioribus basilaribus subconformibus floralibus superioribus trifoliatis v. trisectis segmentis lanceolato-oblongis et lanceolatis, floribus puberulis, sepalis 20–24 mm. longis (in sibiricis longioribus) ovato-lanceolatis versus apicem obtusum acuminatis, calcare uncinatim incurvo laminae 11–13 mm. longae apice truncatae subaequilongo, antheris limbum vix attingentibus, parastemonibus late linearibus apice obtusiusculo apiculato minute hirtulis, pistillis 5–7 stamina haud superantibus dense glanduloso-hirtis, stylo ovariis breviore (descriptio ad exemplaria indica refert). Floret Iunio, Iulio.

Area geographica—Altai australis, Ala-tau, Thian-shan, Ferghana, Yarkand (?), Himalaya occidentalis. Specimina vidi in valle Nila provinciae Garhwal alt. 8–9000′ a Duthieo lecta.

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*var.* η. **varia** *Maly*" (Aquilegia vulgaris typica et Aquilegia subalpina *Boreau, Zimmeter* No. 1),

caule 35–120 cm. altitudine basim versus glabro v. vix puberulo manifesto folioso, foliis caulinis inferioribus basilaribus subconformibus, foliolis fol. bas. infra subglabris v. densiuscule pubescentibus, foliolo medio saepe petiolulato ad tertiam partem v. fere ad medium trilobo rarius tripartito 25–50 mm. longo lobo medio cuneato-obovato v. transverse oblongo lateralibus saepius oblique obovatis, floribus caeruleis interdum albis, sepalis 22–32 mm. longis apice acutiusculo late acuminatis, petalorum lamina rotundato-truncata v. retusa, staminibus petala subaequantibus v. 1–3 millimetris superantibus, calcaribus $\frac{1}{3}$–$\frac{1}{2}$ laminae longitudine, stylo apice recto v. leviter recurvo.

Area geographica—Yarkand (?), Sibiria, Europa, mons Atlas.

*var.* θ. **recticornu** *P. B.*",

caule elato folioso plurifloro, foliis caulinis fere omnibus biternatis vel ternatis, foliolo fol. bas. medio lato trifido v. tripartito partitionibus divergentibus lineari-oblongis longe cuneatis inciso-crenatis crenis obtusis, sepalis oblongis subobtusis circiter 2 cm. longis, petalorum lamina 10–13 mm. longis apice rotundato-truncatis, staminibus limbum attingentibus v. 3 mm. superantibus, calcaribus subulatis rectis v. vix incurvis laminam subaequantibus. Vidi exemplaria in herbario Kurzii e Bavaria missa; calcaria in formis norwegianis etiam leviter incurvata inveni.

*var.* ε. **Ebneri**" *Zimtr.* (Aquilegia Ebneri, *Zimmeter* No. 2),

caule basim versus glabrescente 25–40 cm. altitudine, foliis bas. biternatis, foliis caulinis inferioribus trifoliolatis v. trisectis, foliolis sessilibus v. breviter petiolulatis infra dense pubescentibus medio 19–22 mm. longo fere ad tertiam partem trilobo lobo medio cuneato-obovato, floribus 2 v. 4 rubescenti-caeruleis, sepalis ovato-oblongis circiter 18 mm. longis, petalorum lamina rotundato-truncata circiter 9 mm. longa, calcaribus lamina circiter 6 mm. longioribus hamatis, staminibus petala paullo superantibus, stylo apice uncinato.—Styria.

*var.* κ. **dinarica**" *Beck* (A. dinarica *Beck in Ann. Hofmus.*),

caule 1–2-floro, ad 20 cm. altitudine, usque a basi uti petioli pilis patentibus glanduliferis obsito, foliis pubescentibus basilaribus ternatis foliolis conspicue petiolulatis subcordatis tripartitis rarius trisectis partionibus inciso-crenatis, floribus pilosis, sepalis ovato-oblongis 2–3 cm. longis, albis v. caerulescentibus patentibus, petalorum lamina caerulescenti rotundato-truncata 11–20 mm. longa

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calcaribus graciliter conicis hamato-incurvis laminae subaequilongis, staminibus fere laminae longitudine, stylis quam ovaria paullo brevioribus.—Bosnia.

*var.* λ. **eynensis** *P. B.*",

caule fere ad apicem usque simplici 2–3 floro 25–35 cm. altitudine ut petioli basim versus parce hirto sub floribus glanduloso-pubescenti; foliis bas. biternatis, petiolis 5–10 cm. longis, petiolulis primariis 15–30 mm. longis foliolis breviter petiolulatis v. sessilibus aut subglabris aut utrinque dense pubescentibus basi obtusis, medio subrotundo v. fere reniformi 15–18 mm. longo fere ad medium trilobo lateralibus oblique reniformibus profunde bilobis, lobis crenatis aut bi v. trilobulatis, crenis integerrimis v. paucicrenulatis obtusis v. rotundato-truncatis; folio caulino infimo a basi remoto ternato, foliolis tripartitis partitionibus crenato-incisis; foliis superioribus 2 v. 3, trifoliolatis, foliolis oblongo-lanceolatis pedunculari lineari, sepalis 23–26 mm. longis late ovatis acutis unguiculatis, petalorum lamina truncata v. retusa 10–13 mm. longa, calcaribus uncinatim incurvis quam lamina 1–4 millimetris longioribus, staminibus limbum attigentibus, parastemonibus lineari-lanceolatis ovariis paullo longioribus, stylis apice recurvis antheras vix attingentibus.

Vidi exemplaria pyrenaica in valle d' Eynes lecta. Flos omnino A. vulgaris typicae, sed differt caule subsimplici haud conspicue folioso foliis foliolisque minoribus; ab A. Bertolonii folio caulino infimo basilaribus subconformi (et ab iis remoto), lamina petalorum plane truncata v. retusa distinguenda. An A. pyrenaica var. β. decipiens Grenier et Godron, cuius calcaria dicuntur paullum curvata et lamina retusa; an A. vulgaris var. hirsutissima quam Lespeyres in Flora Pyrenaica nasci scribit ad 'Font de Comps'?

*var.* μ. **paraplesia**" *Schur* (A. paraplesia *Zimmeter* No. 6),

caule 20–30 cm. altitudine basim versus glabrescente subnudo 2–3 floro, foliis basilaribus biternatis, foliolis sessilibus glabris medio basi cuneato ad tertiam partem trilobo, floribus rubescenti-caeruleis (atroviolaceis), sepalis ovato-lanceolatis acutis circiter 32 mm. longis petalorum limbum rotundato-truncatum fere 18 mm. superantibus, staminibus calcaribusque lamina longioribus stylisque limbum attingentibus.—Transsilvania.

*var.* ν. **nigricans**" *Baumgarten* (A. nigricans *Bmgt.* = A. Sternbergii *Rchb.*, *Zimmeter* No. 7, = A. Haenkeana *Koch*),

caule 25–40 cm. altitudine 1–5 floro basim versus glabrescente, foliis biternatis, foliolis fl. bas. saepissime subsessilibus sessilibusve glabris v. vix puberulis, medio ad quartam tertiamve partem trilobo

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basi late cuneato, lobo medio breviter oblongo v. cuneato-obovato, folio caulino infimo basilaribus saepius subconformi, superioribus subsessilibus trifoliolatis trisectisve saepe profunde incisis, floribus azureis v. dilute caeruleis v. lilacino-purpureis, sepalis 27–34 mm. longis, petalorum lamina apice rotundato-truncata v. obtusa 13–15 mm. longa, calcaribus hamato-incurvis quam lamina 3–10 millimetris longioribus, staminibus laminam 1–3 mm. superantibus, stylis apice recurvis v. rectis.—Alpes, Transsilvania.

Sunt in herbariis indicis exemplaria in Gilgit et Kunáwar lecta quae sunt valde similia A. nigricanti; sed calcaria sunt paullo minus incurva et laminam 1–3 millimetris tantum superant; revera formae A. Moorcroftianae' *Wall.*

## Descriptio subspeciei.

Rhizoma descendens fusiforme irregulariter cylindricum interdum pluriceps, cortice nigra v. brunnea, collo petalorum reliquiis vestitum et 5–20 mm. crassitudine, caules 1–3 edens. Caulis erectus superne ramosus raro simplex teres v. obscure angulatus laevis v. leviter sulcatus florifer 25–120 cm. altitudine, sparse foliosus interdum subnudus, aut totus pilis crispulis v. patentissimis plus minus glandulosis obsitus aut basim versus glabrescens, nunc sine viscositate nunc insigniter viscosus. Folia basilaria conferta longissime petiolata caule florifero manifesto breviora (8–) 20–35 cm. longa; petiolus basi in vaginam lanceolatam membranaceam 7–30 mm. longam et pro ratione petioli brevem convergentim plurinerviam dilatatus supra canaliculatus 5–30 mm. longus, 1–3 mm. crassitudine, glaber v. puberulus v. glanduloso-hirtus; lamina biternata, rarius ternata atque foliolis trisectis v. tripartitis; petioli primarii tenuiter sulcati v. esulci, canaliculati, terminalis (1–) 4–9 cm. longus, 0·8–1·5 mm. crassitudine, laterales $\frac{2}{3}$–$\frac{4}{5}$ terminalis longitudine; foliola membranacea interdum textura firmiore viridia infra pallidiora v. glauca tenuiter nervosa supra glabra v. puberula infra glabra v. puberula v. dense pubescentia; terminale longiuscule petiolulatum rarius sessile circumscriptione breviter cuneato-obovatum v. subrhombeum v. reniforme basi obtusa v. rarius acuta late v. subanguste cuneatum v. subrotundatum, (10–) 15–50 mm. longum latitudinis $\frac{2}{3}$–$\frac{4}{5}$ longitudinis, ad quartam v. tertiam partem palmatim trilobum v. ad medium v. ad tres partes tripartitum raro (in ternatis) trisectum, lobo medio cuneate lateque obovato v. rotundo v. breviter lineari-oblongo apice grosse crenato, crenis tribus, rarius trifido, laciniis crenisve apice obtusis v. retusis integerrimis v. paucicrenulatis; lobis lateralibus breviter oblongis v. oblique ovatis obovatisve inaequaliter bifidis v. bilobulatis v. grosse crenatis; foliola lateralia oblique abovata v. rotundato-trapezoidea breviter petiolulata v. sessilia inaequaliter biloba v. bipartita, lobo interno bi v. trilobulato v. fisso, externo semel crenato-inciso crenatove lobis crenisve crenulatis v. integerrimis.

Folia caulina inferiora, si adsunt, pauca basilaribus subconformia sed brevius petiolata, superiorum petioli brevissimi saepe ad vaginam brevem reducti, folia summa saepe trifoliolata v. trisecta foliolis mediocribus v. parvis saepe ovato-oblongis v. lanceolatis integerrimis v. parce incisis; folia peduncularia, si adsunt, bracteiformia parva lanceolata. Inflorescentia rarius uniflora saepissime racemosa

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v. paniculato-corymbosa et 2–15 flora, ramis patentibus v. erecto-patulis; pedunculi 3–9 cm. longi puberuli v. pilis brevibus patentissimis densissime pubescentes haud raro visciduli. Flores saepius maiusculi, caerulei v. caeruleo-violacei v. purpurei, rarius albi v. atro-purpurei. Sepala ovata v. ovato-lanceolata basi saepe abrupte in unguem constricta apicem versus cuneato-acutata v. breviter acuminata, apice acuto, nervis ramosis 3 percursa, 22–35, rarius 18 v. fere 40 mm. longa latitudine $\frac{1}{3}-\frac{1}{4}$ longitudinis, petala 12–22 millimetris excedentia raro iis vix longiora, dorso glabra v. plus minus pubescentia. Petalorum lamina dorso pilosula v. glabra oblonga apice rotundato-truncato obtusa v. retusa raro plane rotundata 9–15 mm. longa; calcar conicum sed apicem versus sensim subcylindricum et uncinatim incurvum rarissime subrectum apice nectarifero capitatum, distantia a puncto insertionis ad partem infimam calcaris 10–19 mm. quam lamina saepissime 1–5 (–8) mm. longior raro subbrevior v. subduplo brevior. Stamina numerosa inaequilonga petala 1–3 rarius 3–10 mm. superantia v. iis vix breviora; filamenta e basi dilatata gradatim angustata; antherae oblongae muticae 1–2 mm. longae. Parastemones lanceolati v. lanceolato-lineares apice acuti apiculati ovaria 1–3 mm. superantes margine plus minus undulati, interdum antheris parvis instructi. Pistilla 5–7, erecta, 12–18 mm. longa, stamina vix superantia v. iis rarius paullulo breviora; ovaria cylindrica 3–6 mm. longa in stylum sensim v. subabrupte attenuata dense hirta; stylus filiformis apice rectus v. plus minus recurvus, ovariis saepissime 2–5 mm. longior raro iis fere aequalis. Folliculi saepissime 5, chartacei, erecti, parralleli rarius a medio divergentim recurvi, e basi ovoidea recurvo-attenuati, stylo filiformi 7–10 mm. longo rostrati, nervis obliquis creberrimis plus minus anastomosantibus conspicue reticulati, sine stylo 18–25 mm. longi. Semina numerosa oblongo-obovoidea, sectione transversa subtriangularia, dorso modice curvata, ventre carinata, nigra v. raro atro-brunnea, nitida v. rarius subopaca et granulata, 2–2·5 mm. longa, crebre minutissimeque punctulata.

## Tabella ad varietates Aquilegiae vulgaris typicae determinandas.

I. Caulis saepius conspicue foliosus ramosus altitudine 35–120 cm., folia caulina inferiora basilaribus subconformia saepe fere eadem magnitudine sed breviter brevissimeve (rarius longiuscule) petiolata, flores 3 v. saepius plures.

A. Flores discolores sepalis cyaneis v. lilacinis (25–35 mm. longis ovato-acuminatis), petalorum lamina alba, calcaria non capitata.

α. Folliculi paralleli subrecti, semina nitida subtilissime punctulata.

**A. caucasica** *Ledeb".*

β. Folliculi usque a medio divergentim reçurvi, semina opaca granulata.

**A. olympica"** *Boiss.*

B. Flores concolores, calcaria plus minus distincte capitata.

α. Stamina petalorum lamina multo breviora, calcar lamina subduplo brevius.

**A. Bernardi"** *Grenier.*

β. Stamina pet. limbum fere attingentia v. eo conspicue longiora.

a. Sepala pet. lamina fere triplo longiora ovato-lanceolata latitudine vix $\frac{1}{3}$ longitudinis (circiter 38 mm. longe 12 mm. lata violaceo-caerulea, stamina limbum 5 mm. superantia).

**A. longisepala"** *Zimtr.*

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b. Sepala pet. lamina subduplo longiora latitudine ⅓–¼ longitudinis.

a. Stamina petalorum limbum 3–10 mm. superantia in columnam subcylindricam associata et si 3 mm. tantum longiora flores atro-purpurei (purpureo-violascentes), caeteroqui flores saepius atro-purpurei rarius caerulei.

**A. atrata**" *Koch.*

b. Stamina petalorum limbum fere attingentia v. eum 3 mm. superantia, flores colore vario.

α. Caulis usque a basi, uti petioli petiolulique, dense glanduloso-hirtus. Flores purpurei v. cinnamoneo-rubescentes.

**A. Karelini** *Baker*".

β. Caulis basim versus glaber v. vix puberulus, flores caerulei.

αα. Calcar uncinatim incurvum.

**A. varia** *Maly*".

ββ. Calcar subrectum v. leviter incurvum.

**A. recticornu** *P. B.*"

II. Caulis 20–35 raro 40 cm. altitudine, aspectum subnudum praebens propter folia caulina basilaribus saepissime manifesto minora, infimo saepe a basi remoto. Flores 1–2 rarius 3 rarissime 4.

A. Sepala circiter 18 mm. longa, folia infra dense pubescentia.

**A. Ebneri**" *Zmtr.*

B. Sepala plus 20 mm. longa.

α. Caulis a basi, uti petioli petiolulique, pilis glanduliferis obsitus, sepala alba v. caerulescentia, folia plura ternata.

**A. dinarica**" *Beck.*

β. Caulis basim versus parce hirtus v. glaber, flores violacei v. caerulei v. rubescenti-cyanei.

a. Caulis basim versus parce hirtus, foliola subtus subglabra v. utrinque dense pubescentia, sepala 23–27 mm. longa.

**A. eynensis** *P. B.*"

b. Caulis basim versus glaber v. puberulus, foliola glabra v. infra vix puberula, sepala (27–) 30–35 mm. longa.

a. Flores cyaneo-rubescentes, sepala petalorum limbum circiter 18 mm. superantia, stamina limbum vix attingentia.

**A. paraplesia**" *Schur.*

b. Flores caerulei rarius purpureo-lilacini, sepala petalorum limbum 6–15 mm. superantia, stamina limbum 1–3 mm. superantia.

**A. nigricans**" *Bmgt.*

III. **Aquilegia alpina**' *Lin.* (Aquilegia vulgaris subsp. alpina *H. f. et T.* in F. B. I. ex parte. Aquilegia alpina *Lin.*; *Allioni*, Flor. Ped. tab. LXVI; *Reichb.* Flor. Germ. tab. CXIX.),

foliis basilaribus omnibus v. pluribus biternatis, foliolis margine sese plus minus obtegentibus terminali reniformi v. suborbiculari fere ad medium trifido v. profundius tripartito, laciniis crenato-incisis, folio caulino infimo petiolato foliolis saepius in lacinias magis dis-



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tincte lineares incisis, floribus subconcoloribus caeruleis 32–45 mm. longis late ovatis, calcare crassiuscule conico subrecto v. manifesto incurvo quam lamina truncato-rotundata paullo breviore v. longiore staminibus lamina 2–6 mm. brevioribus, carpellis 5, folliculis 25–30 mm. longis.

Area geographica—Alpes, Apenniní boreales, (Pyrenaei montes?), Himalaya occidentalis.

*var.* α. **typica**, pistillis antheras vix v. haud attingentibus.

*var.* β. **himalaica** *P. B.*, pistillis antheras 2–3 mm. superantibus.

Forma affinis A. Moorcroftianae *Wall.* var. suaveolenti et A. nivali *Falc.* *var.* saccocentrae. Garhwal (*K.!*).

Formae etiam occurrunt in Himalaya occidentali et in Gilgit, quae mediae sunt inter A. alpina *Lin.* et A. Moorcroftiana *Wall.*

## Descriptio Subspeciei.

Rhizoma fusiforme v. subcylindricum, descendens, vaginis foliorum fusorum plus minus tectum, collo 2–6 mm. crassitudine, caulem solitarium edens.

Caulis teres erectus rectus v. vix flexuosus simplex v. rarius superne parce ramosus manifesto sulcatus v. esulcus, florifer 20–40 cm. altitudine, prope basim 1·5–4 mm. crassitudine, plus minus foliosum, inferne glabrescens v. hirtulus, sub flore dense minuteque glanduloso-hirtus.

Folia basilaria longissime petiolata caule manifesto breviora (5–) 10–25 cm. longa; petiolus basi in vaginam membranaceam late v. anguste lanceolatam convergentim nervosam 1–2 cm. longam et pro ratione petioli perbrevem dilatatus, lamina sesquilongior v. quadruplo longior, supra sulcatus subteres, supra vaginam 1–3 mm. crassitudine, puberulus; lamina biternata, v. folii infimi ternata sed foliolis fere ad basim tripartitis; petioluli primarii tenues v. subcrassi supra tenuiter canaliculati 0.5–1 (–2) mm. crassitudine, terminalis 16–30 (–40) mm. longus, laterales $\frac{2}{3}$–$\frac{3}{4}$ terminalis longitudine; foliola membranacea viridia, infra pallidiora, glabra v. vix hirtula marginibus plus minus sese obtegentia, terminale breviter petiolulatum v. sessile circumscriptione subreniforme v. suborbiculare, aut versus basim obtusam subcuneatum aut basi subtruncatum, 12–40 mm. longum, latitudine $\frac{1}{1}$–$\frac{4}{4}$ longitudinis, saepius fere ad medium trifidum v. ad tres partes tripartitum, lacinia media obovato-oblonga basim versus cuneata latitudine $\frac{3}{4}$–$\frac{4}{6}$ longitudinis, apice crenato-incisa, crenis saepe parce crenulatis, laciniis lateralibus late obliqueque obovatis v. breviter longiusculeve lineari-oblongis inaequaliter crenato-incisis raro integris, lacinula externa breviter oblonga apice subrotundata saepe crenula instructa, lacinula interna saepe crenis tribus instructa; foliola lateralia rarius fere symmetrica atque terminali conformia, saepius asymmetrice reniformia lateve obovata profunde bipartita, partitione externa late et oblique obovato-cuneata bifida aut bipartita, interna inaequaliter biloba lobulo interno saepius crenis 2 externo crenis tribus incisis, crenis omnibus apice obtusis v. subacutis rarius rotundatis; folium primarium interdum foliis basilaribus Aquilegiae pyrenaicae omnino conforme.

Folium caulinum infimum longiuscule petiolatum conspicue vaginatum, petiolo laminae saepe subaequilongo, lamina biternata v. subbiternata interdum laminis fol. bas. conformi saepius laciniis pro ratione longitudinis angustioribus ideoque magis

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distincte linearibus; folia media 1–2, aut nulla, brevissime petiolata, petiolo ad vaginam reducto, lamina aut biternata et laminis foliі infimi subconformi aut ternata et foliolis tripartitis v. trisectis, partitionibus aut integerrimis lanceolatis aut incisis lacinulis lanceolato-linearibus subacutis; folia summa 1–2 bracteiformia linearia acuta 1–2 cm. longa, interdum nulla.

Flores magni, suberecti v. nutantes. Sepala 32–45 mm. longa (rarissime breviora), petalorum limbum 10–22 mm. superantia, late ovata, basi in unguem brevem constricta, apice acuta v. obtusa cuneato-acutata aut breviter acuminata, latitudine fere ½ longitudinis, caerulea rarius albida v. rubescentia apice saepissime virescentia. Petala campanulam efficientia, lamina late obovata apice truncato-rotundata 13–20 mm. longa, sepalis magis dilute caerulea; calcar crassiuscule conicum versus apicem subcapitatum sensim attenuatum 10–25 mm. longum subrectum v. saepius incurvum rarissime fere uncinatum interdum lamina paullo brevius saepius ea 1–6 mm. longius. sub apice saepe 1 5–2 mm. crassitudine. Stamina numerosa (40–50) inaequilonga, longiora lamina petalorum 2–6 mm. breviora, glabra; filamenta a basi plus minus dilatata gradatim attenuata, longiora (3–) 8–12 mm. longa; antherae oblongae muticae fere 2 mm. longae fusco-virentes. Parastomones lanceolati undulati apice acuti 7–10 mm. longi, ovaria superantes, interdum pistilla subaequantes, Pistilla 5 erecta 10–13 mm. longa, stamina superantia v aequantia interdum iis breviora; ovaria subcylindrica 6–7 mm. longa dense hirta; styli subulati infra hirti, ovario paullo v. 3 mm. breviores, apice recti v. leviter recurvi.

Folliculi 5, subparalleli, e basi ovoidea apicem versus attenuati, 25–30 mm. longi, hirti v. pubescentes, stylo 5–8 mm. longo rostrati.

Semina nigra, nitida, obovoidea.

IV. **Aquilegia Bertolonii**, *Schott* (Aquilegia pyrenaica *Bertoloni, et Reichb.*, Ic. Fl. Germ. 4732; A. Bertolonii *Schott*; A. Reuteri *Boiss.*),

foliis basilaribus saepissime biternatis, foliolis margine sese obtegentibus, terminali late obtriangulari trilobo 12–20 mm. longo, lobis crenatis crenis mediis rotundatis v. retusis, folio caulino infimo (fere semper) basilaribus multo minore trifoliolato foliolis lanceolatis integris v. fissis, inflorescentia 1–4-flora, floribus concoloribus, sepalis ovatis 24–30 mm. longis, petalis rotundatis v. subtruncatis, calcaribus conico-subulatis hamato-incurvis, laminam subaequantibus v. ea paullo longioribus, folliculis 12–15 mm. longis.

## Descriptio subspeciei.

Rhizoma fusiforme collo, reliquiis foliorum plus minus tectum. Caulis erectus simplex v. superne modice ramosus vix sulcatus 15–50 cm. altitudine subnudus, aut basim versus glabrescens aut totus tenuiter patentimque glanduloso-pubescens.

Folia basilaria longissime petiolata; petiolus basi in vaginam late lanceolatam brevem dilatatus, 4–20 cm. longus, glaber v. villoso-pubescens; lamina biternata, rarius ternata, foliolis reniformibus profunde trilobis v. trisectis; petioluli primarii saepe villosuli, intermedio 8–30 mm. longo, lateralibus fere ¾ terminalis longitudine; foliola sessilia v. breviter petiolata, textura subfirma, supra viridia et glabra, infra pallidiora et glabra v. puberula, margine sese obtegentia, ad marginem interdum

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ciliatula; terminale foliorum biternatorum late triangulare basi saepe obtusa late cuneatum 12–20 mm. longum, latitudine ¼–⅓ longitudinis, ad tertiam partem v. ad medium regulariter v. irregulariter trilobum, lobo medio breviter oblongo saepissime crenis tribus integerrimis v. vix crenulatis inciso, lobis lateralibus breviter oblongis v. subobovatis crenis binis inaequalibus praeditis; foliola lateralia asymmetrice lateque obovata v. subreniformia terminali angustiora v. latiora basi late cuneata v. obscure cordata, ad tertiam partem v. fere ad basim inaequaliter biloba, lobo interno tri- externo bicrenato, crenis foliolorum omnium intermediis apice apiculato v. mutico rotundato-truncatis v. retusis, lateralibus obtusis.

Folia caulina saepissime basilaribus dissimilia; infimum, si est foliis bas. simile, paullum a basi caulis remotum; folium infimum saepissime basilaribus multo minus, trifoliolatum, foliolis lanceolatis, intermedio integro v. trifido, lateralibus interdum bifidis; superiora simplicia lineari-lanceolata, pedunculania 8–12 mm. longa. Flos lilacinus v. caeruleus, solitarius v. inflorescentia 2–4 flora corymboso- racemosa. Pedunculi graciles, laterales interdum 15 cm. longi, visciduli.

Sepala ovata v. ovato-oblonga, apice acuta v. brevissime acuminata, basi in unguem conspicuum constricta, 24–30 mm. longa, latitudine circiter ½ longitudinis, dorso puberula, petalorum limbum 6–10 mm. superantia. Petalorum lamina apice rotundata v. subtruncata, 14–20 mm. longa; calcar e basi conica subulatum hamatum (rarius levius incurvum), laminae aequilongum v. ea paullo longius. Stamina petalorum limbum aequantia v. saepius eo 1–7 mm. breviora; filamenta angusta, longiora circa 1 cm. longa; antherae oblongae, 1·5–2 mm. longae, muticae. Parastemones lanceolati, apice apiculato obtusi v. acuti, vix v. manifesto undulati, 7–8 mm. longi, ovariis subaequilongis. Pistilla 5; ovaria obato-oblonga, 7–8 mm. longa, hirta, in stylum subulatum leviter recurvum ovariis fere dimidio breviorem gradatim attenuata. Folliculi 5, 12–15 mm. longi, hirti.

Area geographica—Appennini, Alpes pedemontani et maritimi, (Pyrenaei montes ?).

Haec subspecies congeries esse videtur formarum mediarum; nam non solum folia similia sunt foliis A. pyrenaicae, sed transitus etiam animadverti possunt partim in stirpes appenninas A. alpinae floribus quam in formis typicis minoribus atque calcaribus multum curvatis, foliis tamen caulinis A. alpinae genuinae, partim in A. Einseleanam, cuius calcaria haud raro fere hamata sunt. Affinitatibus minus artis etiam cum A. nigricanti" et A eynensi" connexa. Stirpes in Afghania orientali crescentes et varietatem subspecici Meorcroftianae efficientes haud raro A. Bertolonii valde similes, sed calcaria recta vel vix curvata.

V. **Aquilegia viscosa** *Gouan*, (Aquilegia glandulosa, *Gouan* Illustrationes botanicae tab. 19 fig. 1, Flor. Monsp. 267; = Aquilegia Einseleana *Schulz* = A. Bauhini *Schott* = A. pyrenaica *Koch* = A. Kitaibelii *Nyman* ex parte (= A. pyrenaica var. β decipiens *G. et G. ?*); et A. glandulosa *W. et Kit.* = A. Kitaibelii *Schott* = A. pyrenaica *Visiani*; A. thaliotrifolia *Schott*),

foliis basilaribus saepissime biternatis, foliolis subdistantibus

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brevissime petiolulatis v. sessilibus, terminali triangulariter cuneato-obovato latitudine $\frac{1}{3}-\frac{2}{3}-\frac{1}{1}$ longitudinis, folio caulino infimo (v. altero) ternato foliolis segmentisve lanceolatis v. oblanceolatis, summis lanceolato-linearibus, floribus parvulis v. mediocribus caeruleis v. violaceis, sepalis oblongis v. oblongo-lanceolatis 14–27 mm. longis, petalorum lamina rotundata 9–16 mm. longa, calcaribus rectis v. incurvis neque uncinatis, staminibus pet. lamina 2–6 mm. brevioribus, folliculis 5–6 cylindricis patulis 8–15 mm. longis.

Area greographica—Montes Europae centralis. In Himalaya non invenitur; sed varietas A. Moorcroftianae a nobis Winterbottomiana dicta quoad folia valde similis A. thalictrifoliae, et varietas altera, subaphylla, caule foliisque glanduloso-hirtis instructa, A. viscosam typicam in mentem revocat.

*var.* α. **Einseleana**" *Schulz*,

foliolis foliorum basilarium biternatorum infra glabris v. parce rarius subdense glanduloso-puberulis ad quartam vel tertiam partem rarius ad medium usque trilobis lobis saepissime rotundatis v. rotundato-subquadratis v. cuneate obovato-oblongis, foliis caulinis aut minimis aut conspicuis foliis basilaribus subconformibus sed segmentis magis linearibus, superioribus saepius trisectis v. simplicibus segmentis oblanceolatis v. linearibus, calcare laminae subaequilongo rarius $\frac{1}{3}$ eius longitudine, folliculis subsparse glanduloso-hirtulis.—Alpes, Gallia austr.

*var.* β. **thalictrifolia**" *Schott*,

foliis glanduloso-hirtis et ciliatis, foliolis mediis fol. bas. ad medium v. tertiam partem trifidis longe et saepe subanguste cuneatis laciniis lineari-oblongis inciso-serratis, foliis caulinis inferioribus nonnullis foliis basilaribus subconformibus sed laciniis magis linearibus, superioribus trifoliatis v. trisectis segmentis rite lanceolatis, calcare laminae aequilongo v. paullo breviore, folliculis viscoso-hirtulis.—Alpes.

*var.* γ. **Kitaibelii**" *Schott*,

foliolis foliorum basilarium villoso-pubescentibus, foliis caulinis nullis vel 1–2 linearibus v. infimo trisecto, calcare lamina fere duplo breviore, folliculis dense hirtis.—Croatia.

## Descriptio subspeciei.

Rhizoma directione varia, subfusiforme, atrobrunneum, foliorum reliquiis plus minusve vestitum, caules 1–2 edens. Caulis erectus simplex v. superne ramosus teres laevis v. vix sulcatus, florifer altitudine 12–50 cm. prope basim 1–2·5 mm. crassitudine subnudus supra basim aut glabrescens aut villoso-pubescens atque plus minus

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glandulosus aut parce v. densiuscule glanduloso-hirtus; rami, ubi adsunt, graciles patuli.

Folia basilaria longissime petiolata 3–20 cm. longa; petioli basi in vaginam lanceolatam membranaceam 3–7 mm. longam et pro ratione petioli brevissimam convergentim nervosam dilatati, basi breviter canaliculati subteretes, 2–14 cm. longi, 0·5–1·5 mm. crassitudine, subglabri v. pilosuli v. parce glanduloso-hirti; lamina ternata v. biternata, foliolis biternatorum subdistantibus; petioluli primarii tenues leviter sulcati, terminalis 2–45, saepius 5–15 mm. longus, laminae aequilongus v. ea manifesto longior, laterales terminali aut aequilongi aut subduplo breviores; foliola textura firmiora, aut parte utraque glabra aut supra glabra infra puberula v. plus minus glandulosa aut utrinque glanduloso-pubescentia infra pallidiora; foliolum terminale foliorum biternatorum brevissime petiolulatum v. subsessile, triangulare cuneato-obovatum, (5–) 9–20 (–25) mm. longum, versus basim acutam v. obtusiusculam insigniter cuneatum, latitudine $\frac{1}{2}$–$\frac{2}{3}$–$\frac{1}{1}$ longitudinis, apice vix ad tertiam partem v. paullo ultra medium trilobum v. trifidum, lobo medio subquadrato v. lineari-oblongo apice crenis tribus obtusis v. rotundatis inciso, lateralibus breviter semi-obovatis v. lineari-ablongis integerrimis v. crenis binis inaequaliter incisis; foliola lateralia subsessilia v. plane sessilia asymmetrice obovata rarius subtrapezoidea inaequaliter biloba v. rarius bisecta, lobo interno subobovato trifido v. saepissime crenis ternis subinaequalibus inciso, lobo externo bifido v. saepissime integerrimo bicrenatove; foliola foliorum basilarium ternatorum subreniformia v. semiorbicularia, basi truncata v. subcordata, ad duas partes v. fere ad basim palmatim tripartita partitione media cuneato-obovata lateralibus oblique obovatis, omnibus crenatis v. crenato-lobatis.

Folium caulinum infimum interdum foliis basilaribus conforme v. saepius ternatum foliolis segmentisve lanceolatis v. oblanceolatis interdum longissime cuneatis, aut integerrimis apice obtusis, aut incisis; folia intermedia subsessilia, petiolo ad vaginam reducto, trifoliolata, foliolis breviter petiolutatis, aut integerrimis atque oblanceolatis apice rotundatis obtusis acutisve, aut rarius basilaribus conformibus sed minoribus, aut parce incisis; folia summa bracteiformia saepissime integra lanceolato-linearia 3–14 mm. longa.

Flores parvuli solitarii v. 2–5–10 in racemum paniculamve subcorymbosam laxissimam dispositi, nutantes v. suberecti, caerulei v. violacei; ramis laterales inflorescentiae gracilibus infimo interdum 20 cm. longo. Pedunculi apice dense viscoso-hirti. Sepala elliptico-oblonga v. oblongo-lanceolata, apice acuto breviter acuminata, basi in unguem brevem constricta, 14–27 mm. longa, latitudine $\frac{1}{3}$–$\frac{1}{2}$ longitudinis, glabra v. dorso vix puberula, petala 3–14 mm. superantia. Petalorum lamina obovato, apice saepissime rotundata rarissime rotundato-subtruncata; calcar subulatum apice nectarifero capitatum, rectum v. manifesto incurvum neque tamen uncinatum quam lamina 2 mm. longius vel 1–16 mm. brevius, $\frac{1}{3}$–$\frac{1}{1}$ laminae longitudine. Stamina numerosa inaequalia, limbo petalorum 2–6 mm. breviora, glabra; filamenta a basi modice dilatata in apicem filiformem angustata; antherae oblongo-ellipsoideae circa 1·5 mm. longae muticae v. distincte apiculatae flavae. Parastemones lanceolati 6–7 mm. longi apice acuti, plus minus undulati, ovaria superantes. Pistilla 5–6 erecta, 7–10 mm. longa; ovaria cylindrica dense hirta; styli filiformes, apice recti v. ad ultimum recurvi, infra hirti, ovario subaequilongi.

Folliculi 5–6, cylindrici, patuli, apice rotundato obliquo, stylo persistenti filiformi 4–6 mm. longo rostrati, nervoso-reticulati, 12–15 mm. longi, pilosuli v. glanduloso-hirti.

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VI. **Aquilegia grata'** *Maly*, (Aquilegia grata *Maly* in Zimmeter, Mon. Aq. No. 13).

Caule 12–25 cm. altitudine, uti petioli petioluli foliola, usque a basi glanduloso-hirto, foliis basilaribus biternatis, foliolis magnis rotundato-deltoideis margine sese plus minus obtegentibus, foliis caulinis inf. basilaribus subconformibus, floribus 3–5 pallide caeruleis, sepalis circiter 2 cm. longis ovatis, fere 1·5 cm. petala superantibus, pet. lamina circiter 6 mm. longa, calcare recto v. paullum incurvo quam lamina subduplo longiore, staminibus limbum superantibus, folliculis brevibus.—Croatia, Serbia.

VII. **Aquilegia pyrenaica'** *DC.* (Aquilegia pyrenaica *DC.* nec *Koch* neque *Bertoloni* nec *Visiani*),

caule 10–30 cm. altitudine simplici v. subsimplici subnudo v. vix folioso, foliis basilaribus ternatis v. saepius biternatis foliolis approximatis v. margine sese obtegentibus glaberrimis v. infra vix puberulis, terminali late rhombeo v. subreniformi basi late cuneato v. subcordato 3–18 mm. longo, inflorescentia uni v. pauciflora, floribus concoloribus caeruleis rarius discoloribus, sepalis ovatis 16–26 mm. longis, petalorum lamina apice truncato-rotundata v. plane rotundata, calcare recto v. leviter incurvo, staminibus lamina brevioribus, carpellis fere 5 hirtis, folliculis subparallelis 12–15 mm. longis.

*var.* α. **vera**, floribus concoloribus, sepalis saepius plus 2 cm. (sed etiam 16 mm.) longis.

*var.* β. **discolor''** *Levier et Ler.*, floribus discoloribus, sepalis vix 2 cm. longis.

Vidimus exemplaria rara subsp. nivalis, e Kashmiria allata, a var. α. huius subspeciei nullo modo distinguenda.

## Descriptio subspeciei.

Rhizoma horizontale v. descendens, simplex, fusiforme v. cylindricum, atro-brunneum, crassitudine 2–5 mm., collo foliorum reliquiis vestitum, caulem solitarium edens.

Caulis erectus simplex v. apice vix ramosus subteres sulcatus plus minus fistulosus, florifer 10–25 (30) cm. altitudine, prope basim 1–2 mm. crassitudine basi foliosus, infra inflorescentiam nudus v. folio uno alterove instructus, subglaber v. puberulus.

Folia basilaria longissime petiolata sed caule saepissime manifesto breviora raro eum aequantia 3–15 cm. longa; petiolus basi in vaginam membranaceam lanceolatam 6–15 mm. longam et pro ratione petioli brevem convergentim plurinerviam dilatatus, 2–12 cm longus, 0·7–1·5 mm. crassitudine, supra leviter canaliculatus, puberulus v. glaber; lamina aut ternata atque foliolis trisectis v. tripartitis, aut saepius biternata; petioluli primarii tenuiter sulcati glabri v. subglabri, terminalis 7–15 mm. longus, laterales $\frac{1}{2}$–$\frac{1}{3}$ terminalis longitudine; foliola membranacea, valde approximata et

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sese margine obtegentia supra viridia, infra pallidiora v. glauca, glaberrima v. infra vix puberula, lobis vix distantibus v. sese attingentibus v. paullum se obtegentibus; terminale late rhombeum v. subreniforme, basi late cuneatum v. subcordatum v. rotundato-truncatum, 3–18 mm. longum, latitudine $\frac{1}{4}$–$\frac{3}{4}$ longitudinis saepissime latiore quam longiore, ad tertiam partem v. ad medium trilobum v. ultra medium tripartitum v. raro ad basim usque trisectum, lobo medio obovato apice subtruncato crenis tribus instructo, lobis lateralibus breviter oblongis v. oblique obovatis saepissime inciso-lobulatis lobulis parce crenatis v. rarius integerrimis, petiolulo subnullo v. 1–5 mm. longo, uti laterales, glabro v. pilosulo; foliola lateralia brevius petiolulata v. sessilia reniformia v. late trapezoidea v. asymmetrice truncato-obovata profunde inaequaliterque bipartita, partitione interna oblique triangulari v. subreniformi saepe bifida v. lobulis tribus crenato-incisa, partitione externa obovato-oblonga v. semiovata saepissime lobulis binis incisa, lobulis crenisve haud raro parce et subobscure crenulatis apice late obtusis v. rotundatis v. subretusis.

Folia caulina inferiora uno alterove longe v. breviter petiolata, foliis radicalibus aut conformia aut simpliciora aut plane nulla; superiora (floralia) breviter brevissimeve petiolata, petiolo saepius ad vaginam brevem reducto, lamina aut trifoliolata aut trisecta, foliolis v. segmentis trisectis divisionibus lineari-lanceolatis apice acutis v. subobtusis, summa v. omnia saepe integra lanceolato-linearia 7–12 mm. longa. Inflorescentia uni v. pauciflora, floribus mediocribus nutantibus v. suberectis, concoloribus caeruleis v. petalis albis discoloribus. Pedunculi glanduloso-pubescentes. Sepala late ovata v. ovato oblonga, basi in unguem brevem contracta, apice subacuto breviter acuminata, nervis tribus ramosissimis percursa, 16–26 mm. longa latitudine $\frac{1}{3}$–$\frac{2}{3}$ ($-\frac{1}{2}$) longitudinis, petala 5–11 mm. superantia. Petalorum lamina obovato-oblonga v. plane oblonga apice truncato-rotundata v. plane rotundata, 10–16 mm. longa; calcar e basi subangusta conico-subulatum, apice nectarifero vix capitatum rectum v. leviter incurvum, 15–20 mm. longum, $\frac{1}{3}$–$\frac{2}{3}$ laminae longitudine, sub apice 0·5–0·8 mm. crassitudine. Stamina numerosa valde inaequalia, longiora petalorum lamina 2–4 mm. breviora, filamenta e basi modice dilatata in apicem subfiliformem gradatim attenuata, longiora 7–11 mm. longa; antherae elliptico-oblongae 1·5–2 mm. longae apice rotundato muticae. Parastemones ovato-lanceolati v. lineares acuti undulati 7–9 mm. longi, ovaria superantes. Pistilla 5 erecta 8·5–10 mm. longa, staminibus aequilonga v. ea paullo superantia; ovaria 4–5 mm. longa anguste ovoideo-oblonga glanduloso-hirta; styli filiformes subrecti infra hirta ovario subaequilongi v. subduplo longiores.

Folliculi 4–5, subparalleli, subcylindrici, apicem versus modice attenuati, subobliqui, nervoso-reticulati, glanduloso-pubescentes, 12–15 mm. longi.

VIII. **Aquilegia nivalis**' *Falconer* (A. nivalis *Falc.* in herbario Kewensi de sententia Bakeri),

caule 3–30 cm. altitudine 1-v. rarius 2-floro, foliis basilaribus plerisque biternatis, foliolis margine sese obtegentibus 1–16 mm. longis, medio deltoideo v. reniformi basi obtuso v. subcordato fere ad medium trilobo, lobis lobulatis v. crenatis, crenis ovatis et rotundato-subquadratis, foliis caulinis paucis v. nullis vagina conspicua, sepalis stellatim patentibus 12–24–40 mm. longis late ovatis v. oblongis apice obtusis v. subacutis, petalis apice truncatis sinuatis retusis emarginatis, calcare uncinato v. recto conico v. cylindrico

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v. saccato, staminibus saepius lamina brevioribus, carpellis hirtis, folliculis circiter 5 fere 1·5 cm. longis.

*var.* α. **paradoxa** *P. B.*,

saepe caespitosa, caule florifero 4–16 (–24) cm. altitudine, sepalis (12–) 20–25 mm, longis, calcare aut uncinato aut recto aut incurvo et tenui v. crassiuscule cylindrico. Himalaya occidentalis, Gilgit. Lecta in Gilgit (*Giles sub nominibus A. glaucae var. nivalis et A. vulgaris var. pubiflorae*); Kashmir (*herb. Falc! H. Sah! Winterbottom!*); Tibetia occidentalis (*H. E. I. C. No.* 58!); Kunáwar (*Scz!*).

*var.* β. **saccocentra** *P. B.*,

caule florifero 20–30 cm. altitudine, sepalis 35–40 mm. longis, calcare saccato medio 3–4 mm. crassitudine. In valle fluminis Chenab alt. 11000 ped. (*E.!*)

## Descriptio subspeciei.

Rhizoma fusiforme v. irregulariter cylindricum, descendens v. horizontale, subgracile v. percrassum, atro-brunneum, saepe pluriceps, collo vaginis foliorum delapsorum dense vestitum, caules 1–3 edens.

Caulis erectus v. ascendens, simplex v. subsimplex saepissime uniflorus interdum biflorus, nudus v. folium unum alterumve edens, 3–30 cm. altitudine, prope basim 1–2 mm. crassitudine infra aut dense glanduloso-hirtus aut pubescens aut glaberrimus, sub flore semper dense glanduloso-hirtus.

Folia basilaria longissime v. partim longe petiolata; petiolus basi in vaginam membranaceam brunneam 1–2 cm. longam convergentim plurinerviam dilatatus supra basim leviter canaliculatus striatus (1–) 2–8 cm. longus, 0·5–1·3 mm. crassitudine, glaber v. hirsutus; lamina biternata v. folii unius alteriusve ternata; petioluli primarii striati glabri v. plus minus pilosi, terminalis 2–20 mm. longus; foliola marginibus sese obtegentia tenuia 3–16 mm. longa supra viridia infra pallidiora glabra v. vix pilosula, medium reniforme v. deltoideum v. semiorbiculare basi lata obtusum v. subcordatum rarius manifesto cunneatum circiter ad medium regulariter v. subirregulariter trilobum latitudine $\frac{1}{3}$–$\frac{2}{3}$ longitudinis, lobo medio obovato plus minus cuneato raro subintegerrimo (in foliis perpaucis tantum) saepissime trilobulato, lobis lateralibus oblique obovatis v. late irregulariterque obtriangularibus saepius bilobulatis, lobulis integerrimis v. plus minus crenatis; foliola lateralia oblique reniformia latitudine $\frac{1}{4}$–$\frac{3}{5}$ longitudinis, basi subcuneata v. obscure cordata, plus minus profunde (interdum ad basim usque) irregulariter biloba, lobo interno subregulariter trilobulato v. tricrenato, externo bilobulato, lobulis crenatis v. subintegerrimis, crenis foliolorum omnium breviter ovatis v. mediis rotundato-subquadratis plus minus obtusis v. rotundatis.

Folium caulinum infimum, aut unicum, (ubi adest,) longe v. longissime petiolatum maiusculum v. parvum, foliis basilaribus interdum omnino conforme, saepius flori approximatum, petiolo basi in vaginam conspicuam lanceolatam dilatato 1–2·5 cm. longo, lamina saepissime ternata, foliolis nunc tripartis sectisve et foliolis foliis bas. subsimilibus, nunc bi- v. trifidis laciniis lanceolatis nunc lanceolatis integerrimis; folium caulinum summum (v. unicum) saepe lineari-lanceolatum 8–12 mm. longum petiolo ad vaginam conspicuam redacto.



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Flos mainsculus magnusve v. mediocris plus minus nutans.

Sepala stellatim patentia, late ovata v. ovato-oblonga, basi in unguem brevem constricta, apice obtusa v. acutiuscula interdum brevissime acuminata, (12–) 20–40 mm. longa, latitudine (⅓–) ½–⅔ longitudinis, petala 6–12–22 mm. superantia, caerulea, dorso puberula v. glabra. Petalorum lamina obovato-cuneata apice truncata plus-minusve sinuata v. retusa v. emarginata 7–12 mm. longa purpurea v. violacea; calcaria aut e basi brevi ample conica in apicem tenuem uncinatim incurvum ½–⅔ laminae longitudine attenuata, aut a basi conoidea tenuiter cylindrica incurva v. subrecta aut saepius crassiuscule conica leviterque incurva laminae subaequilonga, aut tenuiter conica v. fere cylindrica lamina paullo longiora, aut saccata laminae subaequilonga v. paullo breviora, apice aut conspicue capitata aut obtusissima. Stamina longitudine inaequalia, petalorum lamina paullo breviora raro eorum limbum 1 mm. superantia; filamenta e basi paullum dilatata sensim in apicem attenuata, longiora 6–8 mm. longa; antherae elliptico-oblongae, exteriores saepius maiores, apice muticae, fere 1 mm. longae, flavae v. fusco-virescentes. Parastemones lineares v. lanceolati plus minus undulati apice acuto apiculati 5–7 mm. longi, filamentis longioribus breviores, ovaria superantes, unus alterve saepe anthera parva instructus. Pistilla 5, staminibus breviora v. ea 5 mm. superantia, 9–14 mm. longa; ovaria subcylindrica 4–5 mm. longa dense glanduloso-hirta, in stylum subulatum ad altitudinem variam hirtum ovarii ½–⅔ longitudine apice ad ultimum plus minus uncinatim recurvum subabrupte attenuata.

Folliculi 5 (v. plures ?) suberecti, e basi ovoidea in apicem oblique truncatum paullum attenuati, conspicue transversim reticulato-nervosi, sine stylo circiter 1·5 cm. longi, hirti, stylo filiformi (fere 5 mm. longo) rostrati.

Semina obovoidea, laevia, nigra, (subopaca), circiter 1·5 mm. longa.

IX. **Aquilegia glandulosa'** *Fisch.* (Aquilegia glandulosa *Fischer*, Zimmeter No. 10; A. jucunda *Fischer;* A. Gebleri *Besser;* A. transsilvanica *Schur*, Zimmeter No. 5; A. Fussii *Zimmeter*; A. sulphurea *Zimmeter* No. 9, A. aurea *Janka.* Icones: Delessert Icones vol. I tab. 48 ?; Sweet, Br. Fl. Gard. vol. I tab. 55; Edwards' bot. reg. vol. X, tab. 19; Flore des Serres, vol. V, 535),

caule 12–40 cm. altitudine 1–5-floro, foliis basilaribus biternatis, foliolis margine sese obtegentibus rarius subdistantibus, medio late triangulari v. reniformi rarius rhombeo v. obovato-cuneato trilobo latitudine saepissime ½–⅔ longitudinis, crenis mediis rotundato-subquadratis v. breviter oblongis, folio caulino infimo saepissime brevissime petiolato subtrifoliolato, floribus magnis v. mediocribus, sepalis stellatim patentibus late ovatis v. ellipticis 16–45 mm. longis, petalorum lamina apice rotundata raro obtusa, calcare uncinato ⅛–½ laminae longitudine, staminibus lamina 2–11 mm. brevioribus, carpellis (5–) 6–12 glanduloso-hirtis, folliculis 2–3 cm. longis.

*var.* α. **iucunda''** *Fischer* ex parte (A. glandulosa var. discolor *DC.*),

caule plus minus glanduloso-pubescenti, foliolis saepissime margine sese obtegentibus terminali reniformi basi saepissime sub-

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cordato v. subtruncato, pedunculis plus minus glandulosis, floribus discoloribus lamina alba v. ochroleuca calcare $\frac{1}{3}$–$\frac{1}{1}$ laminae longitudine. Sibiria.

*var.* β. **vera**", (A. glandulosa *Fisch., Zimmeter.* No. 10),
caule foliisque uti in α, floribus concoloribus azureis v. caeruleis, calcare $\frac{1}{4}$–$\frac{3}{4}$ laminae longitudine. Variat floribus magnis v. mediocribus.

subvar. αα. lamina petalorum elliptico-oblonga apice obtusa (=A. glandulosa typica Fischeri).—Sibiria.

subvar. ββ. lamina petalorum oblongo-obovata apice rotundata v. rotundato-truncata (=A. iucunda *Fischer ex parte*).—Sibiria, Transsilvania.

*var.* γ. **sulphurea**" *Zimmeter*, (A. aurea *Janka*, *Zimmeter* No. 9.),
foliolis sese paullum obtegentibus inciso-crenatis, terminali rhombeo basim versus cuneato saepius paullo longiore quam latiore, floribus magnis concoloribus sulphureis v. aureis, pedunculis glabris, calcare fere $\frac{1}{2}$ laminae longitudine.—Macedonia.

*var.* δ **transsylvanica**" *Schur*, (A. transsylvanica *Schur*, *Zimmeter* No. 5; A. Fussii *Zimmeter*),
foliolis sese attingentibus v. vix distantibus, terminali late rhombeo v. subreniformi, pedunculis puberulis v. glabris, floribus magnis concoloribus violaceo-caeruleis, calcare $\frac{1}{2}$–$\frac{2}{3}$ laminae longitudine.—Transsilvania.

*var.* ε. **Gebleri**" *Besser* (?),
foliolis sese attingentibus vix se obtegentibus, terminali subrhombeo versus basim obtusam late cuneato, pedunculis plus minus glanduloso-pubescentibus, floribus concoloribus caeruleis.—Sibiria (*Gebler !*).

## Descriptio subspeciei.

Rhizoma fusiforme descendens collo foliorum reliquiis obtectum.

Caulis erectus simplex v. superne modice ramosus strictus v. vix flexuosus subteres leviter sulcatus, florifer 12–40 cm. altitudine, prope basim 1–4 mm. crassitudine, aut raro totus glaber aut saepius parte inferiore glabrescente sub flore pubescens v. glanduloso-hirtus aut basim versus hirtulus apiceque glanduloso-subtomentosus, subnudus v. parce foliosus.

Folia basilaria longissime petiolata, caule manifesto breviora, 10–30 cm. longa; petiolus basi in vaginam membranaceam lanceolatam v. ovatam 1–2 cm. longam convergentim plurinerviam brunneam dilatatus, subteres, supra canaliculatus, 7–20 cm. longus, 1–3 mm. crassitudine, glaber v. puberulus v. glanduloso-hirtulus; lamina biternata; petioluli primarii supra canaliculati, puberuli v. subglabri, terminalis 1–4 cm. longus, laterales $\frac{2}{3}$–$\frac{1}{1}$ terminalis longitudine; foliola membranacea tenuiter palminervia margine sese obtegentia v. rarius subdistantia, supra viridia infra

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pallidiora, aut utrinque glabra aut supra glabra et infra ad nervos praecipue et prope basim pilosula; terminale sessile v. breviter petiolulatum, rarius subrhombeum v. obovato-cuneatum saepissime late obtriangulare v. reniforme, aut basi obtusa late cuneatum aut obscure cordatum, vix ad tertiam partem v. ad medium usque regulariter v. irregulariter trilobum, 1–3 (–4) cm. longum latitudine ⅓–¾ raro ⅘ longitudinis, lobo medio obovato-cuneato v. breviter lineari-oblongo latitudine ⅓–½ longitudinis apice crenis tribus regulariter v. saepius irregulariter inciso, lobis lateralibus semiovatis v. saepius transverse oblongis obovatisve bilobulatis lobulis inciso-crenatis; foliola lateralia sessilia v. subsessilia asymmetrice reniformia ad medium v. fere ad basim bi- v. triloba, basi latisssime cuneata v. subsemicordata, lobis lobulatis et inciso-crenatis, crenis foliorum omnium mediis rotundato-subquadratis v. transverse longitudinaliterve lineari-oblongis lateralibus breviter oblongo-ovatis, apice obtusis v. rotundatis saepe leviter retusis; petioluli secundarii, ubi adsunt, haud raro magis pilosi quam primarii, terminalis subnullus v. 8 mm. longus, laterales saepe nulli semper terminali breviores.

Folium caulinum infimum interdum longe petiolatum basilaribus subconforme, saepius folia caulina inferiora, ubi adsunt, brevissime petiolata petiolo ad vaginam reducto, lamina subtrifoliolata, foliolis aut trisectis aut integris segmentis foliolisve lineari-lanceolatis; folia summa bracteiformia sessilia trisecta v. saepe lanceolato-linearia raro ovato-lanceolata 5–9 mm. longa, in pedunculis lateralibus praesertim haud raro duo plus minus approximata v. fere opposita.

Flores solitarii v. 2–3 (–5) in racemum subcorymbosum dispositi, nutantes v. erecti, mediocres v. magni. Sepala stellatim patentia, nervis tribus valde ramosis percursa late ovata v. elliptica, basi in unguem perbrevem constricta, apice acuta v. subobtusa saepe brevissime acuminata, 16–20–45 mm. longa latitudine ⅓–⅔ longitudinis, azurea v. dilute caerulea raro aurea v. sulphurea v. albida, dorso glabra v. puberula, apiculo plerumque albicante v. viridi, petala 6–22 mm superantia. Petala aut concoloria caerulea purpurea albida aurea sulphurea aut discoloria calcare azureo v. dilute caerulea ac lamina alba v. ochroleuca, dorso glabra v. puberula; lamina aut obovato-oblonga apice rotundata raro rotundato-truncata aut elliptico-oblonga in apicem obtusum attenuata, 10–27 mm. longa; calcar late conoideum apice capitato uncinatim incurvum, laminae rarius subaequilongum saepius ½–⅔ rarius ⅓ laminae longitudine. Stamina numerosa longitudine inaequalia lamina 2–6 raro 11 millimetris breviora glabra; filamenta longiora 8–11 mm. longa, a basi vix dilatata gradatim attenuata; antherae oblongae 2·5–3·5 mm. longae muticae flavae. Parastemones lineari-lanceolati v. lineares, apice acuto apiculati, undulati 7–9 mm. longi, filamenta longiora aequantes v. iis manifesto breviores, ovaria distincte superantes interdum apicem styli attingentes, apice haud raro antheris parvis globosis instructi. Pistilla 6–12, erecta, supra stamina vix v. 1–3 mm. prominentia raro iis breviora, 8–11 mm. longa; ovaria subcylindrica, dense glanduloso-hirta; stylus filiformis apice subrectus v. circinnatim recurvus, ovario saepissime paullo brevior.

Folliculi 6–12 patuli, a basi ovoidea sensim attenuati, apice obliquo in stylum persistentem attenuati, sine stylo 2–3 cm. longi, hirti saepe glandulosi.

Semina numerosa, cuneato-obovoidea, ventre carinata, saepe 3- v. 5-costata, nigra, nitida.

X. **Aquilegia Moorcroftiana**' *Wall.* (Aquilegia Moorcroftiana *Wall.* Cat. 4713, Royle Ill. 55; Aquilegia glauca *Lindl.* (1840); A. kunaorensis *Camb.* (1844); A. fragrans *Bth.*, *Baker* ex parte; Aquilegia

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vulgaris subsp. 4. alpina, subsp. 5. pyrenaica, *Hook. f. et T. in F. B. I.*; Aquilegia vulgaris, var. pyrenaica et grandiflora *H. f. et T. in F. I.* Icones: Jacq. Voy. Bot. tab. V; Bot. Mag. tab. 4493; *Lindl.* Bot. Reg XXVI tab. 46; Maund's Bot. IV. tab. 151.),

caule 10–80 cm. altitudine conspicue folioso raro subnudo ramoso rarius simplici, foliis basilaribus biternatis v. triternatis, foliolis parvulis v. magnis sese obtegentibus v. subdistantibus, terminali obovato subrotundo reniformi trilobo v. trisecto, foliis caulinis inferioribus ternatis v. biternatis, floribus 3–9 raro solitariis mediocribus v. magnis concoloribus v. discoloribus colore vario, sepalis ovatis v. oblongis 14–45 mm. longis, petalorum lamina saepissime truncata, calcare saepissime subulato recto v. modice incurvo rarius uncinato longitudine comparata vario, staminibus limbum attingentibus v. superantibus, carpellis 5–9 glanduloso-hirtis, folliculis 18–25 mm. longis. Floret ab Iunio ad Septembrem.

Area geographica—Paropamisus, Himalaya alpina et subalpina occidentalis, Afghania orientalis, Belutchia.

*var.* α. **fragrans**" *Bth.* (*Baker* ex parte),

rhizomate crasso, caule 60–90 cm. altitudine, valde folioso, foliis basilaribus biternatis v. saepius plus minus triternatis, petiolulis gracillimis, foliolis tenuibus infra plus minus glaucis, terminali fol. bas. subreniformi profunde tripartito partitionibus 2–3-fidis laciniis lineari-oblongis plus minus inciso-crenatis crenis obtusis v. rotundatis, floribus 2–5 albidis v. pallide purpureis, sepalis ovatis v. ovato-lanceolatis apice obtusiusculis 19–25 mm. longis, calcaribus lamina subduplo brevioribus v. eam subaequantibus apicem versus gracillimis, aut uncinatim incurvis aut rarius subrectis, folliculis 5–7, 16–18 mm. longis.

Lecta in Kashmir (*H. Falc. !*); Gilgit ad Kala Pani 10–11000′ (*G. !*).

*var.* β. **Winterbottomiana** *P. B.*,

caule 25–40 cm. altitudine, foliis basilaribus caulinisque inferioribus aut triternatis aut biternatis atque foliolis trisectis, laciniis foliorum intermediorum oblongo-lanceolatis, petiolulis plus minus glanduloso-pubescentibus, segmentis foliorum flor. inferiorum lineari-lanceolatis latitudine $\frac{1}{6}$–$\frac{1}{4}$ longitudinis, sepalis fere 2·5 cm. longis, petalorum lamina 10–12 mm. longa apice truncata, calcare subhamato circiter 15 mm. longo, carpellis 5–6.

In iugo inter Kashmiria et Daráwar (*Winterbottom !*).

*var.* γ. **suaveolens** (= A. kunaorensis var. β suaveolens *Camb.*; = **A. fragrans** (*Bth.*) *Baker* ex parte,

caule 30–70 cm. altitudine folioso, foliis caulinis saepissime con-

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spicuis, basilaribus biternatis rarius subtriternatis, foliolis membranaceis infra saepissime plus minus glaucis terminali fol. bas. reniformi v. semiorbiculari v. subrotundo fere ad basim usque tripartito v. ad tertiam partem trilobo segmentis 2 v. 3 lobis v. crenatis lobis crenisque obtusis breviter lineari-oblongis, foliis caulinis superioribus valde variis, floribus saepissime 5–12, sepalis albidis v. stramineis, petalis saepe violaceis v. purpureis sed etiam albidis 25–50 mm. longis acutis v. acuminatis, calcaribus laminam 1–10 mm. superantibus rectis v. leviter incurvis, carpellis 6–9, folliculis sine stylo 20–25 mm. longis. Vidi allatam e Gilgit (*T! Biddulph!*), Kashmiria (*Sedgewick! W. S. A.! Levinge!*), Drankar 17–19000′ (*Scz.!*), Lahúl (*H. Calc.! J! H!*), Pangi (*Scz.!*), valle fl. Chenab superiore (*B. P.!*).

*var.* δ. **glauca**" *Lindl.*,

foliis basilaribus biternatis glaucis, laciniis fol. intermediorum obovato-cunneatis v. breviter oblongis, segmentis fol. flor. inf. obovato-cuneatis v. late lanceolatis, sepalis 25–30 mm. longis stramineis v. albo-purpureis, petalorum stramineorum calcaribus rectis conicis apice capitatis lamina truncata 2–4 mm. brevioribus, carpellis 6 (v. pluribus ?), folliculis circiter 2 cm. longis.

Kashmiria (Forma rara et vix a varietate ε distinguenda).

*var.* ε. **kunaorensis**" *Camb.* (A. kunaorensis *Camb.* var. α = A. Moorcroftiana *Wall.* Cat. No. 4713 a Royleo in Ill. male descripta),

foliis plus minus glaucis, basilaribus aut triternatis, aut biternatis et foliolis fere ad basim usque tripartitis, petiolis petiolulisque glabris v. parce hirtulis, foliis flor. inf. trifoliolatis v. trisectis foliolis subrhombiis v. late lanceolatis, sepalis 14–23 (saepissime 17–21) mm. longis stramineis v. saepius violaceis, petalorum violaceorum v. plus minus ochroleucorum lamina 9–17 mm. longa, calcare recto v. leviter incurvo 11–21 saepissime 14–18 mm. longo lamina saepissime 3–10 mm. longiore rarissime vix breviore, carpellis 5 rarius 6, folliculis 15–20 mm. longis. Gilgit (Giles sub nomine A. fragrantis! et A. Moorcroftianae *Wall*? ! et A. viridiflorae!); Baltistan, prope Kapala (*Hunter-Weston!*), Ladakh (*Moorcroft!*), in Kurang prope Rumbog (*Scz.!*); Kunawar (sec. *Jacqem.*); Afghanistan, in valle Kurrum (' A. vulgaris, var. Moorcroftiana Wall.' Aitch.), ad Kairwas 12000 ped. (' *Aquilegia vulgaris, var. fragrans Benth.*', *Aitch.*), in rupestribus montium Safed Koh 10–12000 ped. (' *A. pubiflora Wall., var. humilior*,' *Aitch. et Hemsl., A. pubiflora Boiss.* Fl. Or. Suppl. *nec Wall.*).

*var.* ζ. **Wallichiana**" (A. Wallichiana *in herb. Calc.*), uti var. ε, sed foliolis viridibus nec glaucis. Kumaon (*Vicary!*).

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*var. η.* **afghanica** *P. B.*,

caule 10–30 cm. altitudine 1–4 (–6)-floro usque a basi villoso-pubescenti plus minus glanduloso, petiolo petiolulisque plus minus villosis, foliis basilaribus biternatis, foliolulis textura firmiore saepissime manifesto petiolulatis glabris v. puberulis nec glaucis intermedio plus minus profunde trilobo lobis parce crenatis crenis rotundatis rarius breviter oblongis, foliis caulinis variis interdum subconspicuis, sepalis 18–28 mm. longis, lamina petalorum truncata, calcare lamina longiore subulato recto v. subincurvo, staminibus petala 1–4 mm. superantibus, carpellis 5. Floret ab Iunio ad Aug.

Afghania orientalis; in valle Kurrum—in monte Sikarám 10–14000 ped. (*Aquilegia nov. sp. Aitch.*). Calcaribus exceptis, valde similis Aquilegiae Bertolonii.

*var. θ.* **subaphylla** *P. B.*,

caule 25–35 cm. altitudine simplici v. superne parce ramoso a basi usque, uti petioli petioluli pedunculi, glanduloso-hirto, foliorum basilarium biternatorum lamina 2·5–5 cm. longa, foliolis parvulis breviter petiolulatis textura subcarnosa glabris v. puberulis terminali reniformi trilobo 12–18 mm. lato, lobis parce crenatis, foliis caulinis inferioribus 1 v. 2 ternatis v. subbiternatis, sepalis circiter 2 cm. longis, petalorum lamina rotundato-truncata, calcare subulato recto lamina longiore, staminibus limbum pet. 2–5 mm. superantibus.

In valle Spiti, versus iugum Ringun 13–14000 ped. (*Scz. !*), prope Thissigaong 15–16000 ped. (*Scz. !*).

## Descriptio subspeciei.

Rhizoma descendens v. horizontale crasse fusiforme v. cylindricum, interdum pluriceps, nigricans, collo vaginis foliorum fusorum vestitum, caules 1–3 edens.

Caulis erectus v. ascendens rarissime simplex saepissime superne plus minus ramosus, teres, sulcatus, altitudine 10–80 cm., basi 1·5–4 mm. crassitudine, conspicue foliosus raro subnudus, puberulus v. glabrescens aut a basi villoso-pubescens v. glanduloso-hirtus.

Folia basilaria longissime petiolata caule florifero breviora 5–12–35 cm. longa; petiolus basi in vaginam lanceolatam membranaceam 15–30 mm. longam convergentim nervosam dilatatus, canaliculatus 3–20 cm. longus crassitudine 1–2 mm., hirtus v. puberulus; lamina biternata raro ternata, interdum triternata; petioluli primarii tenues puberuli v. pubescentes v. glanduloso-hirti, terminalis 2–8 cm. longus 0·8–1·5 mm. crassitudine, laterales $\frac{1}{3}$–$\frac{1}{4}$ terminalis longitudine; foliola margine approximata v. sese obtegentia, membranacea raro subcarnosa, supra glauca v. viridia infra pallidiora saepius glauca, glabra v. puberula v. densiuscule pubescentia, tenuiter nervosa; terminale circumscriptione late obovatum v. obovato-cuneatum v. suborbiculare v. semiorbiculare v. reniforme, longe v. breviter petiolulatum, basi late cuneata obtusum v. truncatum v. subcordatum, 9–50 mm longum latitudine $\frac{1}{1}$–$\frac{3}{4}$ longitudinis, fere ad medium trilobum v. ad basim usque trisectum v. rarius tri-

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foliolatum segmentis vix v. haud margine imbricatis, segmento lobove medio cuneato-obovato apice crenis grossis v. lobulis tribus inciso, segmentis lateralibus aut late oblongis aut oblique cuneato-obovatis inaequaliter bilobulatis lobulis plus minus grosse crenatis v. integerrimis; foliola lateralia aut trapezoidea aut terminali subconformia, crenis brevissime lineari-oblongis v. oblongo-ovatis apice obtusis v. rotundatis; petioluli ultimi glabri v. villoso-pubescentes, terminalis 2–35 mm. longus, laterales multo breviores v. nulli.

Folia caulina intermedia, uno alterove saepe longe petiolato excepto, breviter brevissimeve petiolata, inferiora saepe biternata superiora haud raro ternata, foliolis lateralibus fol. bitern. sessilibus v. vix petiolulatis folia summa subsessilia reliquis multo minora trifoliolata v. trisecta ad ultimum saepe integra bracteiformia anguste lanceolata, segmentis integerrimis v. incisis saepissime lanceolatis, interdum ovatis acutis v. acuminatis, 1–3 cm. longis.

Inflorescentia rarissime subuniflora, saepissime 3–9 flora corymboso-paniculata, ramis valde elongatis. Pedunculi graciles teretes dense pubescentes saepe viscosi. Flores mediocres v. magni subnutantes, concolores v. discolores. Sepala ovata v. ovato-oblonga, nervis tribus ramosissimis percursa, apice acuta v. obtusa, cuneato-attenuata v. acuminata, basi saepe abrupte constricta, 14–45 mm. longa, latitudine circiter $\frac{1}{3}$ longitudinis dorso puberula violacea v. purpurea v. straminea v. albida, petala 4–15 mm. superantia. Petala glabra v. calcaria puberula, v. purpurea v. violacea v. straminea v. ochroleuca v. albida; lamina obovata, apice truncata rarius truncato-rotundata, 11–15 mm. longa; calcar e basi conoidea sensim in partem apicalem tenuiter cylindricum v. subulatum attenuatum, raro uncinatim incurvum saepius rectum aut a basi aut apicem versus incurvum, laminae subaequale v. ea sesquilongum raro duplo longius v. duplo brevius, apice manifesto v. vix capitatum.

Stamina longitudine inaequalia, numerosa, longiora petalorum limbum subaequantia v. paullo superantia, glabra, filamenta angusta e basi paullum dilatata sensim attenuata; antherae oblongae v. ellipticae muticae circiter 2 mm. longae. Parastemones ovato-lanceolati vix v. distincte undulati acuti ovaria superantes.

Pistilla 5–9, stamina vix v. manifesto superantia, 9–14 mm. longa; ovaria cylindrica dense hirta plus minus glanduloso-pilosa, in stylum subulatum parte inferiore hirtum apice rectum v. recurvum aequilongum v. sesquilongum attenuata.

Folliculi 5–9 patuli subcoriacei subcylindrici, e basi ovoidea sensim attenuati, apice oblique rotundato-truncati, nervis obliquis crebris prominentibus plus minus anastomosantibus reticulati, sine stylo 18–24 mm. longi, plus minus hirti, stylis filiformibus 6–10 mm. longis apice saepe circinnatim recurvis rostrati.

Semina numerosa cuneato-obovoidea ventre carinata, interdum subcostata, nigra, nitida v. subopaca, vix punctulata, 2–2·5 mm. longa.

## Tabella ad varietates Aquilegiae Moorcroftianae determinandas.

I. Caulis plus minusve conspicue foliosus et saepissime (30–) 40–90 cm. altitudine, basim versus glabrescens v. parce hirtulus.

A. Calcar petalorum lamina brevius v. eam vix aequans.

α. Sepala 19–25 mm. longa; calcaria uncinata v. plus minus manifesto incurva; folia basilaria saepe triternata.]

**A. fragrans".**

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β. Sepala 25–30 mm. longa; calcaria recta v. vix incurva; folia basilaria biternata. (Flores albidi v. straminei.)

**A. glauca".**

B. Calcar lamina paullo v. multo longius.

α. Laciniae foliorum caulinorum mediorum oblongo-lanceolatae; segmenta foliorum floralium inferiorum lanceolata, latitudine $\frac{1}{3}$–$\frac{1}{4}$ longitudinis; calcar gracillimum lamina vix longius subhamatum; (sepala fere 2·5 cm. longa; stirps aspectum A. thalictrifoliae praebens).

**A. Winterbottomiana".**

β. Laciniae foliorum mediorum lineari-oblongae v. obtuse ovatae v. rotundato-subquadratae. Calcar rectum v. leviter incurvum, gracile v. crassiusculum.

a. Sepala 25–50 mm. longa. Carpella 6–9.

**A. suaveolens".**

b. Sepala 14–23 mm. longa. Carpella 5–6.

α. Foliola infra plus minus glauca.

**A. kunaorensis".**

b. Foliola utrinque viridia, infra pallidiora.

**A. Wallichiana".**

II. Caulis (saepissime) subnudus v. foliis uno alterove vix conspicuo instructus, 10–40 cm. altitudine, a basi usque villoso-pubescens aut, uti petioli petiolulique, glanduloso-hirtus.

A. Caulis usque a basi, uti petioli petiolulique, villoso-pubescens, 10–30 cm. altitudine.

**A. afghanica".**

B. Caulis usque a basi, uti petioli petiolulique, glanduloso-hirtus, 30–40 cm. altitudine.

**A. subaphylla".**

XI. **Aquilegia leptoceras'** *Fisch. et Meyer* (1837). (Aquilegia leptoceras *Fisch. et Mey.* Linnaea XII, Litt. 153; Bot. Reg. X, 64; Flore des Serres III, 296),

caule humili (circiter 20 cm. alt.), foliis aut biternatis, aut ternatis atque foliolis tripartitis, glabris, terminali obovato cuneato apice ad tertiam quartamve partem trilobo latitudine circiter $\frac{2}{3}$ longitudinis, floribus compluribus, discoloribus, sepalis stellatim patentibus ovato-oblongis 18–22 mm. longis, petalorum lamina apice rotundato-truncata v. retusa, calcare conico recto v. subincurvo, staminibus pet. limbum superantibus, carpellis 5.

## Descriptio subspeciei.

Caulis humilis (circiter 20 cm.) teres pluriflorus aut basim versus glaber aut, uti petioli petiolulique, totus pubescens. Folia longiuscule petiolata, partim biternata, partim ternata atque foliolis profunde tripartitis; petioli foliorum maiorum 4–8 cm. longi basi vaginantes; petioluli primarii teretes terminalis 1–2 cm. longus laterales $\frac{1}{2}$–$\frac{2}{3}$ terminalis longitudine; foliola membranacea, viridia infra pallidiora, glabra, foliorum biternato um sessilia; terminale obovatum basi cuneatum apice ad



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quartam v. tertiam partem trilobum 15–20 mm. longum latitudine circiter ⅔ longitudinis; lateralia obliqne obtriangularia plus minus profunde biloba; lobis foliolorum omnium parce inciso-crenatis, crenis obtusis. Folia caulina inferiora 1–3 brevius petiolata, snbbiternata; intermedia sessilia trifoliolata v. trisecta plus minus fissa; petiolaria lanceolata bracteiformia.

Flores mediocres. Sepala stellatim patentia, ovato-oblonga, basi breviter constricta, apice obscure producto subobtusa, 18–22 mm. longa, latitudine circiter ¼ longitudinis, laete lilacino-caerulea, apicem versus albescentia, vero apice viridescentia. Petalorum lamina obovato-cuneata, apice rotundato-truncata v. retusa, 10–12 mm. longa, albida apice ochroleuca; calcar graciliter conicum, rectum v. modice incurvum, apice subcapitatum, fere ½ laminae longitudine, laete caeruleum. Staminа petala 2–5 mm. superantia; antherae elliptico-oblongae muticae flavae. Pistilla 5, stamina paullo superantia; ovaria pubescentia (an unquam glabra ?); styli subrecti.

Folliculi recti v. apice divergentes. sine stylo 20–22 mm, longi, (glabrescentes ?).

Dauria, Sibiria transbaicalensis.

Valde affinis A. Moorcroftianae' var. kunaorensi.

XII. **Aquilegia lactiflora'** *Kar. Kir.* (Aquilegia lactiflora, *Karelin et Kirilow* in Mosc. Bull. 1841, vol. XIV, p. 374),

caule subprocero folioso parce ramoso, foliis biternatis, foliolis sessilibus v. breviter petiolulatis maiusculis viridibus ad medium fere tripartitis segmentis inciso-crenatis crenis rotundatis v. oblongis, inflorescentia fere triflora, sepalis oblongo-lanceolatis 15–20 mm. longis lacteis petalorum limbo fere duplo longioribus, calcaribus gracilibus rectis v. leviter incurvis laminae aequilongis v. ea manifesto longioribus apice nectarifero vix capitatis, staminibus petalorum laminam rotundatam subaequantibus, carpellis 5 villosis.

Area geographica—Montes Tarbagatai Asiae rossicae.

XIII. **Aquilegia pubiflora'** *Wall.* (Aquilegia pubiflora *Wall.* Cat. 4714; *Royle* Ill. pag. 55.),

caule (15–) 40–70 cm. altitudine saepissime superne ramoso et folioso, foliis basilaribus saepius biternatis, foliolis mediis subrhombeis v. subreniformibus saepius ad medium trifidis latitudine ¼–⅔ longitudinis, foliis caulinis saepissime conspicuis, inflorescentia (1–) 2–5 (–10)-flora, floribus mediocribus, sepalis ovato-lanceolatis (12–) 20–28 mm. longis latitudine saepius ⅓ longitudinis, petalorum lamina apice rotundata raro rotundato-truncata, calcare uncinato rarius modice incurvo saepissime quam lamina breviore, staminibus laminam subaequantibus, carpellis 5-6 glanduloso-hirtis, folliculis fere 2 cm. longis.

Floret a Maio ad Iulium.

Area geographica—Himalaya occidentalis temperata (frequens) et subalpina (rara), Afghania orientalis.

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*var.* α. **Cunninghami** *P. B.*,

caule 25–40 cm. altitudine plus minus folioso paucifloro, sepalis acutis petala paullo superantibus, calcaribus incurvis neque uncinatis. Himalaya pentapotamica (*Cunningham !*).

*var.* β. **Massuriensis** *Royle*,

caule 40–80, raro 12–30 cm. altitudine plus minus ramoso (2–) 3–8 floro conspicue folioso, sepalis longe acuminatis petala multo superantibus, calcaribus brevibus.

*subvar.* αα caule 40–80 cm. alt. calcare subcircinnatim incurvo. Afghania, in valle Kurrum (*Aitch !*), in monte Shendtoi (*Aitch. !*); Kashmiria (*H. Sah. !, Sedgewick !*); Dalhousie (*herb. Dr. !*); Sirmor, in monte Chúr 9–10,000′ (*herb. Dr. !*); Simla (*T. T. !*), in silva Mashobra (*G. !*); Jaunsar Bahar, in montibus Droban (*B !*), ad Pakri (*B !*); Baira (*B !*), montes Trusa (*B !*); Tihri-Garhwal: supra Bhowáni 13–14000′ (*D !*), in valle Gangis 6–7000′ (*D !*), ad Nag Tibba 8–9000′ (*Gollan !*), Massuri (*Royle ! K !*); Kumaon; prope Naini Tal (*A ! Dd !*), in valle Nila 8–9000′ (*D !*).

*subvar.* ββ. caule 12–30 cm. altitudine, calcare hamato rarius levius incurvo.—In montibus prov. Simla (*herb. Dr. !*).

*var.* γ. **subnuda** *P. B.*,

caule gracili 15–35 (–40) cm. altitudine simplici v. apice 2–3-floro vix folioso, sepalis longe acuminatis petala manifesto superantibus, calcaribus brevibus subcircinnatim incurvis. N. W. Him. (*Wall.* Cat. 4714 !); ad Serahan (*Scz !*), Dalhousie 7000′ (*Clarke !*) Simla (*Scz !*), Garhwal (*herb. Falc. ! K !*).

## Descriptio subspeciei.

Rhizoma horizontale v. verticale, subcylindricum v. subfusiforme, cortice nigra, collo foliorum reliquiis vestitum et 3–15 mm. crassitudine, caules 1–3 edens.

Caulis erectus, superne ramosus raro simplex, teres, leviter sulcatus, fistulosus, florifer saepissime 40–70 cm. rarius 15 cm. altitudine, basi 1·5–3 mm. crassitudine, foliosus raro subnudus, subglaber v. plus minus hirtellus.

Folia basilaria longissime petiolata caule florifero saltem subduplo breviora 5–30 cm. longa; petiolus basi in vaginam lanceolatam membranaceam 10–30 mm. longam convergentim nervosam dilatatus, subteres tenuiter sulcatus, basi supra leviter canaliculatus, 2·5–20 cm. longus, 1–2 mm. crassitudine; lamina biternata rarius triternata, raro folio uno alterove ternato atque foliolis trisectis; petioluli primarii graciles subglabri v. prope insertionem petiolorum secundariorum praesertim villoso-pubescentes, terminalis 12–50 mm. longus 0·4–0·8 crassitudine, laterales $\frac{5}{8}$–$\frac{3}{4}$ terminalis longitudine; foliola tenuiter membranacea, viridia infra pallidiora, terminale longiuscule v. breviter petiolulatum v. subsessile circumscriptione subrhombeum subisodiametricum 1–4·5 cm. longum latumque et basi late cuneatum, vel semiorbi-

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culare v. subreniforme basique subtruncatum, saepissime fere ad medium palmatim trilobum rarius ad duas partes v. fere ad basim usque tripartitum, lobo medio cuneato-obovato v. breviter oblongo, latitudine ⅓–½ longitudinis, symmetrice v. asymmetrice lobato-crenato crenis lateralibus duabus saepius integerrimis terminali brevioribus, lobis lateralibus breviter lineari-oblongis parce crenatis v. irregulariter inciso-crenatis crenis paucicrenulatis v. integerrimis; petiolulus secundarius medius cm. longus v. subnullus, laterales terminali manifesto breviores v. sessiles; foliola lateralia trapezoidea asymmetrice lateque cuneata, ad medium v. fere ad basim inaequaliter bipartita v. tripartita lobatave partitione externa inaequaliter crenate bilobata media triloba v. triorena, lobis crenisve integerrimis v. paucicrenulatis, crenis apice obtusis v. rotundatis, ovatis v. breviter oblongis.

Folia caulina intermedia sparsa sursum gradatim minora et brevius petiolata, basilaribus subconformia sed foliola haud raro subsessilia et lobi saepe manifestius lineari-oblongi; folia floralia inferiora brevissime petiolata, petiolo ad vaginam linearem 3–7 (–16) mm. longam reducto, ternata v. subbiternata foliolis longe petiolulatis trisectis v. tripartitis, segmentis incisis laciniis sublinearibus crenato-serratis rarius lanceolatis; folia floralia superiora subsessilia trisecta, segmentis lateralibus integris lanceolatis, rarius trifidis, integerrimis v. parce serratis, terminali integro v. trifido, summa saepe bracteiformia lanceolata.

Inflorescentia raro uniflora saepissime 2–5 (–8)-flora, laxissima. Pedunculi graciles 2–10 cm. longi leviter sulcati v. teretes, apicem versus pilis patentissimis dense pubescentes interdum viscosi. Flores mediocres erecti v. nutantes purpurea v. lurida, concolores. Sepala membrancea ovato-lanceolata longe acuminata rarissime cuneato-acutata, basi saepe constricta, apice semper obtusiusculo herbacea, 20–28 rarius 12–16 mm. longa, latitudine saepissime circiter ¼, rarius ⅓ v. ½ longitudinis, nervis 3 ramosis apicem versus convergentibus percursa, petala 6–14 mm. excedentia rarissime petala paullulo tantum superantia, dorso plus minus pubescentia. Petala dorso puberula; lamina oblongo-obovata apiceque rotundata rarius oblonga truncata 11–18 mm. longa; calcar e basi ample conoidea subabrupte v. sensim in partem apicalem subcylindricam v. leniter conicam attenuatum, apice circinnatim v. uncinatim incurvum ⅓–⅔ laminae longitudine rarius leviter incurvum, apice vix capitatum. Stamina 30–40, laminam petalorum vix superantia; filamenta inaequalia, longiora 7–9 mm. breviora 5–6 mm. longa, e basi modice dilatata in partem superiorem angustissime linearem angustata; antherae conformes, oblongae, 2–2·5 mm. longae. Parastemones oblongi, apice acuto apiculati, subundulati, 5–6 mm. longi, subpersistentes. Pistilla 5–6, erecta v. subpatula, 10–13 mm. longa; ovaria cylindrica patentim pubescentia, in stylum gradatim v. subabrupte attenuata; styli subulati ovario vix v. multum longiores, apice ad ultimum recurvi.

Folliculi 5–6 chartacei, subcylindrici et apicem versus paullum attenuati, in stylum filiformem 5–6 mm. longum oblique attenuati, tenuiter sed conspicue crebreque reticulato-nervosi, subglabri, sine stylo circiter 2 cm. longi, aut paralleli aut saepissime a medio recurvi et apice late divergentes.

Semina numerosa, oblonga, sectione transversa subtriangularia dorso leviter curvata ventre carinata, testa nigra v. subbrunnea nitida laevi.

Folia et foliola A. vulgari plerumque subsimilia, sed interdum omnino sunt Aquilegiae pyrenaicae.

XIV. **Aquilegia Ottonis'** *Orph.* (Aquilegia Ottonis, *Orphanides* in Boiss. Diagn. ser. II. No. 1 pag. 14 et 15; Aquilegia Amaliae *Held-*

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*reich* in Boiss. Diagn. ser. II. No. 1 pag. 11; A. pyrenaica=A. Bertolonii =A. Magellensis *Porta et Rigo exsicc.*; A. nevadensis *Boiss.* ?),

caule, uti petioli petiolulique, glanduloso-pubescenti, 35–70 cm. altitudine 1–6 floro folioso; foliis basilaribus biternatis; foliolis sessilibus v. saepius petiolulatis supra viridibus infra glaucis basi longe cuneatis, terminali ad medium usque v. ultra medium tripartito, partitione media crenis tribus, lateralibus crenis binis incisis, crenis integris v. crenulatis; foliis caulinis inferioribus duobus v. tribus foliis basilaribus subconformibus v. brevius petiolatis, superioribus trifoliolatis v. trisectis segmentis lineari-lanceolatis, summis lanceolatis integris, floribus paullo minoribus quam in Aquilegia vulgari typica (var. varia *Maly*), sepalis oblongis acutis pallide violaceis v. laete caeruleis, petalorum lamina albida apice rotundata v. rotundato-truncata, calcaribus apice subincurvis laminae subaequilongis, staminibus limbum superantibus, carpellis parallelis v. apice divergentibus, 12–15 mm. longis seminibus granulatis.—Graecia, Italia meridionalis, (Sierra Nevada ?).

*var.* α. **typica,**

foliolis in segmenta oblonga ultra medium incisis, sepalis calcaribusque laete caeruleis obtusiusculis, petalis apice rotundato-truncatis, (carpellis apice divergentibus).

*var.* β. **Amaliae** *Heldr.*,

foliolis ad medium usque bi- v. trilobis, sepalis calcaribusque pallide violaceo-caeruleis acutis, petalis apice rotundatis, (carpellis parallelis).

## Tabella analytica ad subspecies Aquilegiae vulgaris *Lin.* determinandas.

I. Alabastri subcylindrici. Sepala in flore aperto erecto-patuli (oblongo-lanceolata. Flores bicolores. Calcaria saepissime uncinata).

**A. oxysepala** *Trautv.*

II. Alabastri, neglectis calcaribus, plus minus ovoidei v. ellipsoidei. Sepala in flore patentia v. patentissima.

A. Calcaria in flore aperto uncinatim incurva.

α. Calcaria laminae subaequilonga v. ea manifeste longiora.

a. Stamina longiora lamina 1 mm. breviora v. 1–10 mm. longiora.

α. Folliculi 18–25 mm. longi, e basi ovoidea attenuati. Folia caulina infima haud raro foliis basilaribus subconformia, (foliola fol. bas. 10–50 mm. longa).

α. Crenae fol. bas. breviter lineari-oblongae, mediis rotundato-subquadratis. (Foliola tenuia, plus minus glauca; calcaria gracillima gradatim hamata; flores albidi v. straminei v. pallide purpurei).

**A. Moorcroftiana** *Winterbottomiana*.

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β. Crenae fol. bas. saepissime rotundatae v. obtusae. (Foliola viridia; calcaria crassiuscula saepe subabrupte uncinata; flores purpureo-caerulei v. violacei v. caeruleo-lilacini v. rufescenti-cinnamonei.)

**A. vulgaris'** *Lin.*

b. Folliculi 12–15 mm. longi. Folium caulinum infimum saepissime foliis basilaribus dissimile. Foliola media fol. bas. 12–20 mm. longa.

**A. Bertolonii'** *Schott.*

b. Stamina quam lamina 2–11 mm. breviora.

a. Crenae mediae fol. bas. rotundatae v. rotundato-subquadratae. Folia caulina saepius basilaribus dissimilia. Lamina petalorum saepius apice rotundata.

α. Pistilla 5. Folliculi 12–15 mm. longi suboylindri. (Sepala 24–30 mm. longa, apice acuta v. acuminata. Flores caerulei).

**A. Bertolonii'** *Schott.*

β. Pistilla (5–) 6–12. Folliculi 20–30 mm. longi, e basi ovoidea plus minus attenuati. (Sepala 16–45 mm. longa. Flores saepe discolores.)

**A. glandulosa'** *Fischer.*

b. Crenae mediae fol. bas. breviter lineari-oblongi. Folia caulina inferiora basilaribus subconformibus, laciniis vero saepissime magis linearibus. (Sepala saepissime 32–45 raro 27 mm. longa. Flores subconcolores. Folliculi 24–30 mm. longi.)

**A. alpina'** *Lin.*

B. Calcaria ⅓–⅔ laminae longitudine.

a. Stamina petalorum limbo 2–11 mm. breviora.

a. Calcaria e basi late conoidea in apicem uncinatum attenuata. Caulis 12–40 cm. altitudine. Petalorum lamina rotundata v. oblonga et apice obtusa. Flores caerulei v. discolores. Sepala saepe plus 30 (16–45) mm. longa.

**A. glandulosa'** *Fischer.*

b. Calcaria gracilia. Caulis 50–70 cm. altitudine. Lamina rotundato-truncata. Flores violacei. Sepala minus 30 mm. longa.

**A. vulgaris'** *Lin.* **Bernardi''** *Gren.*

b. Stamina limbum fere attingentia v. superantia.

a. Petalorum lamina apice rotundato-truncata v. plane truncata.

α. Caulis 3–25 cm. altitudine, 1- (rarissme 2-) florus, saepissime unifolius. Flores caerulei v. petala purpurea. Sepala ovata apice obtusa.

**A. nivalis'** *Falc.*

β. Caulis 40–70 cm. altitudine, foliosus, 2- v. pluriflorus. Flores albi v. straminei v. pallide purpurei. Sepala ovato-lanceolata v. elliptico-oblonga breviter acuminata.

**A. Moorcroftiana' fragrans''.**

γ. Caulis 12–80 cm. altitudine, saepius pluriflorus et foliosus. Sepala saepissime anguste ovato-lanceolata longe acuminata. Flores purpurei v. luridi.

**A. pubiflora'** *Wall.*

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b. Petalorum lamina apice rotundata.

**A. pubiflora'** *Wall.*

B. Calcaria recta vel leviter incurva neque uncinata.

A. Petalorum lamina fere 6 mm. longa. Calcar lamina plus duplo longius. (Stirps glanduloso-pubescens pluriflora foliosa.)

**A. grata'** *Maly.*

B. Lamina 9–45 mm. longa. Calcar laminae subaequilongum v. sesquilongum, rarius lamina fere duplo brevius, rarissime duplo longius.

a. Stamina limbo 2–6 mm. breviora. Flores caerulei.

α. Petala apice saepissime rotundata. Sepala 14–27 mm. longa. Folliculi subcylindrici, 8–15 mm. longi.

a. Foliolum medium foliorum basilarium biternatorum triangulariter cuneato-obovatum v. cuneato-deltoideum, latitudine ⅓–¼ longitudinis. Foliola distantia v. approximata. Caulis petioli petioluli saepius hirti v. pubescentes.

**A. viscosa'** *Gouan.*

β. Foliolum medium fol. bas. reniforme v. late rhombeum, latitudine (⅓–) ½–⅔ longitudinis. Foliola sese attingentia v. saepius sese obtegentia.

**A. pyrenaica'** *DC.*

b. Petala apice rotundato-truncata. Sepala 32–45 mm. longa. Folliculi e basi ovoidea attenuati 25–30 mm longi.

**A. alpina'** *Lin.*

b. Stamina petalorum limbum fere attingentia v. superantia. Flores haud raro discolores, sepala saepe albida v. straminea v. violacea.

α. Petalorum lamina apice rotundata.

a. Flores concolores. (Semina minutissime punctulata, fere laevia).

aa. Sepala oblongo-lanceolata (15–20 mm. longa) petalaque colore lacteo.

**A. lactiflora'** *Kar. Kir.*

ββ. Sepala ovato-lanceolata rarissime ovata (12–28 mm. longa). Flores purpurei v. luridi.

**A. pubiflora'** *Wall.*

β. Flores discolores, sepalis ac calcaribus violaceo-caeruleis, petalis albidis. Semina granulata.

**A. Ottonis' Amaliae''** *Heldr.*

b. Petalorum lamina rotundato-truncata.

a. Semina granulata. (Caulis 35–70 cm. alt., foliis bas. biternatis, sepalis calcaribusque laete caeruleis, lamina pet. albida).

**A. Ottonis' typica''** *Orph.*

β. Semina microscopice punctulata, fere laevia.

aa. Latitudo folioli terminalis fol. bas. ⅓–½ longitudinis. Folia basilaria vix unquam simpliciter ternata.

αα. Flores saepius 3–9. Sepala apice cuneato-acutata v. acuminata. Calcaria subulata. Pet. lamina apice rotundato-truncata.

aa. Flores caeruleo-violacei, concolores.

**A. vulgaris** *Lin.* **recticornu** *P. B.''*

ββ. Flores concolores albidi v. straminei, v. discolores sepalis dilute violaceis petalis ochroleucis v. caeruleis v. purpureis.

**A. Moorcroftiana'** *Wall.*

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bb. Flores solitarii v. raro 2. Sepala apice obtusa. Calcaria crassiuscule conoidea v. subcylindrica v. saccata. Pet. lamina apice truncata et sinuata, v. retusa, v. emarginata.
**A. nivalis'** *Falc.*

bb. Latitudo folioli medii fol. bas. fere ⅓ longitudinis. Folia saepe simpliciter ternata. (Sepala caerulea, pet. lamina ochroleuca.)
**A. leptoceras'** *Fisch. et Mey.*

Aquilegia autem inter Ranunculacearum genera recentior videtur esse. Quae sententia non solum insigni illa mutabilitate formarum atque summa omnium inconstantia notarum quibus rerum herbariarum periti ad species discernendas uti consuerunt, sed etiam subspecierum per regiones boreales orbis terrarum distributione comprobatur. Nam varietate varia Aquilegiae vulgaris typicae excepta, nulla subspecies vel varietas montuosis Asiae communis est cum regionibus Europae occidentalis, atque una tantum species, A. glandulosa, non solum in iugis Sibiriae sed etiam in montibus transsilvanicis nascitur. Aquilegia quidem atrata in saltibus thianshanicis gigni dicitur, sed veri simile est stirpem illam in varietate Karelini Aquilegiae vulgaris adnumerandam esse. Neque dubitandum est quin stirpes illae himalaicae, quae morphologice ab A. pyrenaica' et A. alpina' nullo modo differunt, varietates existimandae sint Aquilegiae nivalis' et Moorcroftianae', nec proxime connexae cum formis illis in Alpibus et monte pyrenaeo natis.

Atque propter artissimam omnium Aquilegiarum cognationem vix difficile esse dixeris historiam generis vestigare. Et certum quidem est nectaria formae illius priscae, ex qua omnes species Aquilegiae ortae sunt, ecalcarata fuisse, cum non solum flores monstrosas A. vulgaris ecalcaratas in hortis nasci videamus, sed etiam, quod maximi argumenti est, species una rite ecalcarata a Potanino ex Kansu allata sit. Sed inter stirpes generi Aquilegiae propinquas vix ullae sunt quae tam insignem Aquilegiae ecalcaratae vel Aquilegiae brevistylae similitudinem prae se ferant quam Isopyri species nonnullae asiaticae et americanae. Et petala gibba Aquilegiae ecalcaratae petalis quarundam formarum Isopyri microphylli et grandiflori simillima, sed duplo vel triplo maiora; haec interdum a vera basi aperta minimeque bilabiata, obovato-oblonga, dorso vix minus gibba quam petala A. ecalcaratae, apice retusa v. emarginata, nervis interdum ramosis. Et quamquam nectaria Aquilegiae brevistylae, quae statura foliorumque figura Isopyro biternato quam proxime accedit, calcarata sunt, eorum laminae haud raro more Isopyri grandiflori v. anemonoidis apice sunt emarginatae. Carpella autem A. brevistylae interdum glabra sunt et nucleus ovulorum binis integumentis vestitus, uti sunt in grege Isopyrorum.

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Quarum rerum considerationem sequentibus nobis licitum concessumque sit speciem illam antiquam, cui Aquilegiam cascam nomen dicere liceat, quasi construere atque aedificare. Stirps erat altitudine mediocri, foliis biternatis, floribus parvulis, sepalis quinque, nectariis subconcavis gibberis apice emarginatis, filamentis staminum intimorum lanceolatis antheris parvis terminatis, carpellis quinque glabris, seminibus laevibus. Hanc speciem terra genuit illa, qua Asia et America olim iuncta erant. Ex ea natae sunt species illae priscae asiaticae atque americanae: primum Aquilegia ecalcarata, tum, gibbere in calcar producto, Aquilegia parviflora et Aquilegia brevistyla. Cum autem initio huius aevi planities Sibiriae et Europae septentrionalis e mari glaciali emersissent et caelum mitius fieret, species illae priscae primum varietates tres ediderunt: unam carpellis glabris (A sibiricam), alteram (A. viridiflorum), Aquilegiae parviflorae proximam, sepalis vix praeter nectaria eminentibus sed carpellis hirtis, tertiam sepalis petalisque valde variabilibus, carpellis autem semper hirtis. Tertia haec species parens fuit duarum gregum, quarum una, sepalis lanceolatis erecto-patulis alabastris subcylindricis, regionum illarum incola fiebat quae a mari gobiensi ad orientem solem spectabant; altera autem non solum per regiones Asiae borealis ac centralis, sed etiam per Europam totam usque ad montem Atlantem late diffundebatur. Mirifica vero eius facultas ad varias conditiones caeli loci insectorumque se accommodandi. Nam flores mediocres stirpium in locis silvaticis demissioribus ortarum in montibus altioribus saepe maximi atque speciosissimi evadunt, ut facilius apes papilionesve procul ad se alliciant. In locis humidioribus autem caules petioli foliolaque saepe magis villosa vel hirta, atque in stillicidiis rupestribus conspicue glanduloso-pilosa.

Ab Aquilegia autem vulgari mutabilitate nequaquam superata est grex illa quae, orta, ut videtur, in Asia orientali, per Alashkam et Montes saxosos diffusa usque ad mare atlanticum et in Americam centralem pervenit.

Vix dubitandum esse opinamur quin Aquilegia canadensis originem trahat a parente varietatis illae Aquilegiae formosae cuius imaginem Planchon*) in tabula nomine Aquilegiae arcticae depinxit; verisimile autem est Aquilegiam arcticam, quae vix a varietate kamtshatica a Fischero descripta calcaribus brevioribus videtur differe, profectam esse a forma illa prisca Asiae orientalis, quae, immigrans in regiones mandshuricas et sinenses in Aquilegiam oxysepalam commutata est. Nam utrum stirps illa, cui Aquilegiam hybridam Sims dixit nomen, hibrida fuerit an species vera nescio; stirpes vero, quas Ledebour scribit e semi-

* Flore des Serres fig. 795.



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nibus davuricis in horto dorpatensi natas esse, vix dixeris hibridas fuisse Aquilegiae vulgaris et Aquilegiae canadensis. Folia autem et alabastri figura et sepalorum directio et color floris, uti depicta sunt in tabula Simsii, omnino sunt Aquilegiae oxysepalae, neque similitudo Aquilegiae hybridae cum Aquilegia arctica et A. canadensi minus insignis.

At vero quanta nectariorum est mutabilitas in Aquilegia formosa! Nam varietas arctica, in tabula picta a Planchon lineis descripta et a Bongard in insula Sitcha lecta, non solum sensim sensimque in Aquilegiam truncatam, varietatem eximiam, transit, sed calcaria stirpium in horto kewensi cultarum gracillime evadebant atque calcaribus Aquilegiae caeruleae simillima. At Ledebour in annotatione ad Aquilegiam formosam discrimen huius speciei et Aquilegiae canadensis partim in longitudine calcaris cum lamina comparata ponit; dicit enim de A. formosa :—'calcaribus rectis lamina truncata quadruplo longioribus genitalia subaequantibus, sepalis ovato-lanceolatis patentissimis genitalia calcariaque superantibus,' et de A. canadensi :—'calcaribus rectis lamina truncata duplo longioribus, genitalia subaequantibus, sepalis ovatis calcaribus genitalibusque brevioribus, stylis demum exsertis.' Vidimus tamen specimina A. canadensis var. typicae calcaribus lamina quintuplo longioribus et sepalis florum apertorum androecio sublongioribus.

Atque formae illae cultae, quae cum stirpibus kamtshaticis quoad calcaris longitudinem cum laminae mensura comparatam congruere videntur, ab Aquilegia chrysantha non distinctae nisi notis, ut videtur, vilibus. De staminibus Aquilegiae caeruleae ante diximus. Mensura autem calcaris cum limbo nectariorum comparata vehementer variat; lamina enim nunc vix vicesima pars calcaris nunc calcare ferme sesqui longior. Forma quoque limbi petalorum vix ad species discernendas apta; nam in exemplaribus in horto kewensi cultis lamina a medio versus apicem attenuata est,* quod vidimus etiam in Aquilegia truncata; in varietate arctica autem Planchonii et in varietate typica Fischeri† nectariorum lamina est apice truncata. Aquilegiae igitur americanae idem spectaculum praebent atque Aquilegiae asiaticae et europaeae: omnes enim partes, quae quidem ad praegnationem ope insectorum factam aptae sint, eximie mutabiles esse, praesertim cum pollen etiam sine adiumentis externis et adventiciis in stigmata eiusdem floris pervenire potest. At vero cum meminimus Aquilegiam arcticam, formosam Fischeri, truncatam ad eandem speciem pertinere atque stirps illa in tabula 6552 Bot. Mag. depicta, non possumus non concludere Aquilegiam caeruleam et chrysantham quoque ad eandem gregem esse redigendas.

* Vide etiam Bot. Mag. tab. 6552.

† Ledebour, Flora rossica vol. I.

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Discrimen autem Aquilegiae Skinneri et A. canadensis in magnitudine florem positum est. Sepala vero A. canadensis typicae nunc vix 12 mm, nunc fere 24 mm longa, ac magnitudinem florum notam demonstravimus esse maxime dubiam in Aquilegiis himalaicis. Quapropter credimus fore ut formas medias inter A. canadensem et A. Skinneri in Mexico boreali inveniantur.

Insigne unum et solum quod, praeter indumentum carpellorum, magis constare reperimus in cognatione Aquilegiae vulgaris est directio sepalorum ; nam cum in plerisque subspeciebus sepala patentia vel patentissima sint, in Aquilegia oxysepala sepala saepissime erecto-patula reperiuntur, vix unquam subpatentia. Non est hoc tamen semper signum certum speciei bonae ; nam sepala A. canadensis typicae interdum magis patent quam solent in stirpibus plurimis, neque sunt, ut videtur, semper patentissima in Aquilegia chrysantha. Quodsi hanc notam putemus ad species internoscendas non satis habere facultatis, ac si reliquorum inconstantiam signorum in mente agitemus, harum rerum cogitatione coactis nobis, quamvis invitis, concedendum esse videtur, formas omnes americanas ad duo species referendas esse : unam, Aquilegiam brevistylam, quae vinculis propinquitatis maxime cum Aquilegiae sibirica coniuncta est, alteram quae, magis cognata Aquilegiae oxysepalae, Aquilegiam formosam, truncatam, caeruleam, chrysantham, flavescentem, canadensem, Skinneri amplectitur. Hac sententia perducti Aquilegias americanas hoc modo disponendas esse existimamus.

(1). **A. brevistyla** *Hook.*

(2). **A. canadensis** *Lin.*

*subsp. I.* **A. formosa'** *Fischer.*
*subsp. II.* **A. caerulea'** *James.*
*subsp. III.* **A. flavescens'** *Wats.*
*subsp. IV.* **A. canadensis** *typica Lin.*
*subsp. V.* **A. Skinneri'** *Hook.*

Si vero directioni sepalorum maiorem ad species discernendas vim tribuamus, formas americanas hoc modo disponere licuerit.

(1). **A. brevistyla** *Hook.*

*var. α.* **vera**, carpellis pubescentibus.
*var. β.* **leiocarpa** *P. B.*, carpellis glaberrimis. Montes saxosi.

(2). **A. formosa** *Fischer.*

*Subsp. I.* **vera.**

*var. α.* **arctica** *Planch.*, nectariorum lamina truncata, calcaribus subinfundibuliformibus lamina sesqui v. subduplo longioribus.

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*var.* β. **kamtshatica** *P. B.*, lamina truncata, calcaribus lamina subquadruplo longioribus.

*var.* γ. **truncata** *Fisch.*, lamina truncata v. apicem versus obtusa calcaribus conicis vel crasse subulatis multo breviore.

*var.* δ. **saxicola** *P. B.*, lamina rotundato-ovata apice obtusa calcaribus subulatis breviore.

*Subsps. II.* **caerulea** *James.*

*var.* α. **macrantha** *Hook.*, floribus albidis v. plus minus caeruleis v. ochraceis.

*var.* β. **chrysantha** *A. Gray*, floribus aureis.

(3). **A. flavescens** *Wats.*

(4.) **A. canadensis.**

*Subsp.* I. **typica.**

*var.* α. **vera**, sepalis 10–24 mm. longis, calcaribus lamina duplo v. quintuplo longioribus elongato-subinfundibuliformibus.

*var* β. **Fendleri**, sepalis fere 9 mm. longis, calcaribus elongatis gracilibus.

*Subsp.* II. **Skinneri** *Hook.*

Aquilegiam Skinneri vero, dum formae mediae inter hanc formam et A. canadensem desunt, speciem propriam sumere licebit.

Adicimus tabellam analyticam ad species subspeciesque americanas determinandas.

I. Calcar crassiuscule subulatum manifesto incurvum laminae aequilongum v. ea paullo brevius. Sepala 12–18 mm. longa. Stamina petalorum limbo breviora. Carpella glabra v. pubescentia.

**A. brevistyla** *Hook.*

II. Calcaria aut elongato-infundibuliformia lamina paullo v. permulto longiora recta v. leviter incurva aut gracillime subulata aut conica. Stamina saepius ultra limbum pet eminentia vel, si limbo breviora, sepala 2 cm. longa v. longiora. Carpella hirta.

A. Sepala patentia v. patentissima.

𝔄. Calcaria gracillime subulata.

a. Filamenta in columnam subcylindricam sociata, stamina conspicue exserta. Flores aurei v. calcaria sepalaque plus minus lateritia v. rubra.

**A. formosa** *Fisch., subsp.* **vera**, *ex parte.*

b. Filamenta plus minus divergentes, haud raro in capitulum subglabosum congesta, v. si subparallela, stamina pet. lamina breviora v. eam fere aequantia. Petalorum lamina apice truncata. Flores albi, ochroleuci, caerulei, aurei. (Calcaria 25–70 mm. longa.)

**A. caerulea** *James.*

𝔅. Calcaria elongato-infundibuliformia. Columna staminea cylindrica petala multo superans.

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a. Calcar lamina sesqui v. permulto longius. Sepala calcariaque lateritia v. rubra.

**A. formosa** *Fisch. subsp.* **vera** *ex parte.*

b. Calcar lamina vix longius. Flores flavi. (Sepala 12–18 mm. longa.)

**A. flavescens,** *Wats.*

B. Sepala erecta, erecto-patula v. vix patentia.

α. Calcaria 15–25 mm. longa. Folliculi fere 2 cm. longi.

**A. canadensis** *Lin.*

β. Calcaria fere 4 cm. longa. Folliculi 3–3·5 cm. longi. (Sepala virentia.)

**A. Skinneri** *Hook.*

Nunc progrediamur ad species, quas quidem accipiamus, rite definiendas.

Ne tamen nimia nominum ac synonymorum stirpium americanarum confusio exstiterit, Aquilegiam formosam et flavescentem ab Aquilegia canadensi sciungemus, quae res necessitatem nobis affert, si quidem nobismet ipsis velimus constare, Aquilegiae oxysepalae ab Aquilegia vulgari separandae.

I. **Aquilegia ecalcarata** *Maxim.*,

sepalis subpatentibus 1 v. fere 1·5 cm. longis, nectariis gibbis nec calcaratis, lamina apice complanata fere $\frac{1}{4}$ sepalorum longitudine, carpellis hirtis. (Vix ab A. parviflora separanda.)

II. **Aquilegia parviflora** *Ledebour*,

sepalis patentibus 1–1·4 cm. longis, nectariis breviter calcaratis, lamina apice obtusa concava sepalis subduplo breviore, carpellis hirtis.

III. **Aquilegia viridiflora** *Pallas*,

sepalis patentibus v. patulis (virescentibus) 10–18 mm. longis, nectariorum lamina subcomplanata subbrevioribus v. fere $\frac{1}{3}$ eius longitudine, calcaribus rectis v. apice incurvis, carpellis hirtis.

IV. **Aquilegia brevistyla** *Hooker*,

sepalis patentibus 12–15 cm. longis, nectariorum lamina apice haud concava sepalis subduplo breviore, calcaribus crasse subulatis modice incurvis fere laminae longitudine, carpellis glaberrimis v. pubescentibus.

V. **Aquilegia sibirica** *Lam.*,

sepalis patentibus v. patentissimis 13–25 mm. longis, nectariorum lamina apice non concava $\frac{2}{3}$–$\frac{3}{4}$ sepalorum longitudine, calcaribus subulatis apice hamatis, carpellis glaberrimis v. ad suturam ventralem minute puberulis.

VI. **Aquilegia vulgaris** *Lin.*,

sepalis patentibus v. patentissimis nectariorum lamina saepissi-

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me manifesto longioribus, alabastris (calcaribus neglectis) ovoideis v. ellipsoideis, nectariorum lamina apice non concava calcaribus rectis v. uncinatis forma varia, carpellis hirtis.

VII. **Aquilegia oxysepala** *Trautv.*,

sepalis erecto-patulis, nectariorum calcaribus hamatis (vix unquam rectis) subulatis lamina sepalis manifesto breviore sublongioribus, carpellis hirtis.

VIII. **Aquilegia canadensis** *Lin.*,

sepalis erectis v. erecto-patulis 9–25 mm. longis, nectariorum lamina longioribus, calcaribus lamina duplo v. quintuplo longioribus elongato-subinfundibuliformibus v. gracilibus, carpellis hirtis.

IX. **Aquilegia flavescens** *Wats.*,

sepalis plus minus reflexis nectariorum lamina paullo longioribus, calcaribus lamina vix longioribus elongato-subinfundibuliformibus subincurvis, (floribus flavis), carpellis hirtis.

X. **Aquilegia formosa** *Fisch.*,

sepalis patentissimis v. subreflexis rarius patentibus nectariorum lamina manifesto longioribus, calcaribus aut crassiuscule conicis lamina multo longioribus, aut elongato-subinfundibuliformibus lamina sesqui v. subduplo longioribus aut gracillime subulatis rectis v. modice incurvis, carpellis hirtis.

Aquilegia vero volubilis *Maack* mihi plane ignota.

Cognationes autem specierum generis Aquilegiae in tabula nostra prima monstrare conati sumus; in tabula secunda affinitates gregis Aquilegiae vulgaris exhibentur; in tertia denique propinquitates formarum americanarum indicavimus.

Atque ut in rerum, de quibus quaesierimus, repetitione per capita decurramus, haec nos existimamus demonstravisse:—

(1) indumentum caulis et foliorum ad species generis Aquilegiae discernendas non usui esse;

(2) folia basilaria ac caulina quoad divisiones foliolorumque figuram et magnitudinem ita variabilia esse ut ad species seiungendas non valeant, quod quidem saepe accidit in generibus, quae constant ex stirpibus, quarum folia sunt composita;

(3) partes eas stirpium, quae in praegnatione ope insectorum facta auxilio sint, saepe mutabilitate maxima affectas esse, ut notae ab iis sumptae, uti magnitudo colorque florum, nectariorum forma, mensurae comparatae nectarii ac staminum atque carpellorum, directio partis styli stigmatosae, haud raro dubiae sint minimeque certae;

(4) omnes Aquilegias artissima naturae colligatione consociatas esse, quod efficiat ut formae hibridae quam facillime ex formis diversis procreentur, quae res notissima est hortulanis;

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(5) stirpes omnino similes non solum ex eadem forma sed etiam ex diversis in locis longinquis atque disiunctis nasci posse, sicuti: A. glandulosa ex varietate quadam Aquilegiae vulgaris in montuosis Sibiriae ac Transsilvaniae; aut A. pyrenaica ex A. Bertolonii in monte pyrenaeo et ex A. nivali in terra gilgitensi; vel A. iucunda, ut videtur, ex A. vulgari in Sibiria et ex A. nivali in Kashmiria; vel A. alpina ex A. Bertolonii vel e varietate nigricanti Aquilegiae vulgaris in Alpibus et montibus appenninis, et ex A. Moorcroftiana suaveolenti in Himalaya centrali;

(6) varietatem eandem, cum in locis diversissimis orta sit, in uno loco saepius stabiliorem esse quam in reliquis, sicut Aquilegia pyrenaica satis constat in Pyrenaeis, sed maxime fluxa est in montuosis altissimis Himalayae occidentalis;

(7) verisimile esse eandem formam interdum in locis diversissimis inveniri quod varietas recentior in figuram speciei parentis translata sit (atavismus), sicuti stirpes indicae Aquilegiae vulgaris verae ex Aquilegia pubiflora natae videntur esse.

## EXPLICATIO FIGURARUM TABULAE SEXTAE.

1–3. Isopyrum grandiflorum, ½, *Afghanistan.*
4–8. Isopyrum microphyllum, ½, *Himalaya bor. occ.*
9. Idem, ½.
10. Aquilegia parviflora, *Sibiria.*
11. Isopyrum grandiflorum, ½, *Vallis Kurrum.*
12. A. ecalcarata, ½, *Kansu.*

Figurae 13–74 magnitudine propria descriptae sunt.

13–18, 20, 21, 21* A. nivalis' paradoxa", *Gilgit, Kashmir, Tibetia occ.*
19. A. nivalis' saccocentra".
22–26. A. Moorcroftiana' fragrans", *Kashmir, Gilgit.*
27. A. alpina', *Mont Cenis.*
28. eadem, *Helvetia.*
29. eadem, *Mons appenninus.* Folia caulina A. alpinae typicae.
30. eadem, himalaica", *Garhwal.*
31. A. glandulosa' typica Fischeri, *Sibiria.*
32. A. glandulosa, *Sibiria.*
33. A. Moorcroftiana' suaveolens", *Lahul.*
34. eadem, *Vallis flum. Chenab.*
35. A. Moorcroftiana' kunaorensis", *Kashmir.*
36. eadem, *Gilgit, Ladakh.*
37, 38. eadem, *Kashmir.*
39. A. viscosa' Einseleana", *Venetia.*
40–42. eadem, *Val Sassina.*
43. A. viridiflora, *Thian Shan.*
44. eadem, *Mongolia.*
45–50. A pubiflora'.

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45. *Silva Mashobra prope Simla*, 46. *Massuri*, 47. *Garhwal*, 48. *S*
49. *Simla*, 50. *Him. pentapotamica.* Sepala florum 48 et 49 lance
acuminata.
51. A. vulgaris' eynensis", *Valle' d' Eynes.*
52. A. vulgaris' Karelini", *Vallis Nila.*
53. A. vulgaris' recticornu", *Bavaria.*
54. A. pyrenaica', *Montes pyr. occ.*
55. eadem, *Herb. Forestier*, *Mons. pyr.*
56–58. A. Moorcroftiana' suaveolens", *Ladakh.*
59–61. A. Moorcroftiana' kunaorensis", *Gilgit.*
62. eadem, *Ladakh*, eadem ac 35.
63. A. pubiflora', *Silva Mashobra*, eadem ac 45.
64. eadem, *Vallis Kurrum.*
65. eadem, *Simla.*
66. eadem, *Him. occ.*
67, 68. eadem, *Him. pentapotam.*, ex eodem flore; eadem ac 50.
69. eadem, *Simla.*
70. eadem, *ex eodem loco atque* 67.
71. Carpella A. pubiflorae'.
72. Carpella A. kunaorensis".
73. Carpella A. nivalis'.
74. Apex parastemonis A. Karelini".
75. Parastemones A. pubiflorae'.
76. iidem, aucti.
77. Parastemones A. Moorcroftianae', aucti.

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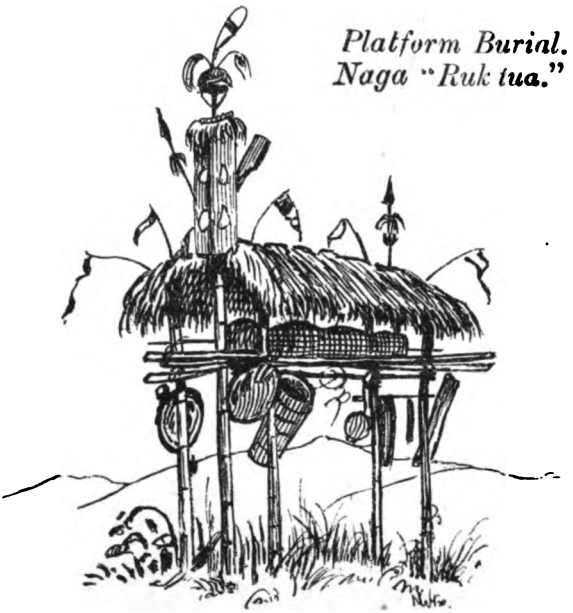
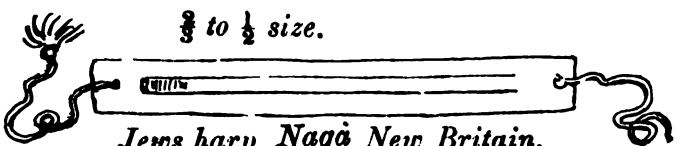


*Platform Burial.*
*Naga "Ruk tua."*

*Formosa, Borneo, Papua, Solomon Is. and Aru Is., Marquesas. pts. of Africa & Australia, often as a canoe on posts.*



*⅔ to ½ size.*

*Jews harp Naga New Britain, Phillipines, &c.*

*Naga Tung Kung.*

*Canoe Drum, can be heard at 8 & 10 miles. Tavaka of New Hebrides. Lali of Fiji.*

*S. E Peal..*



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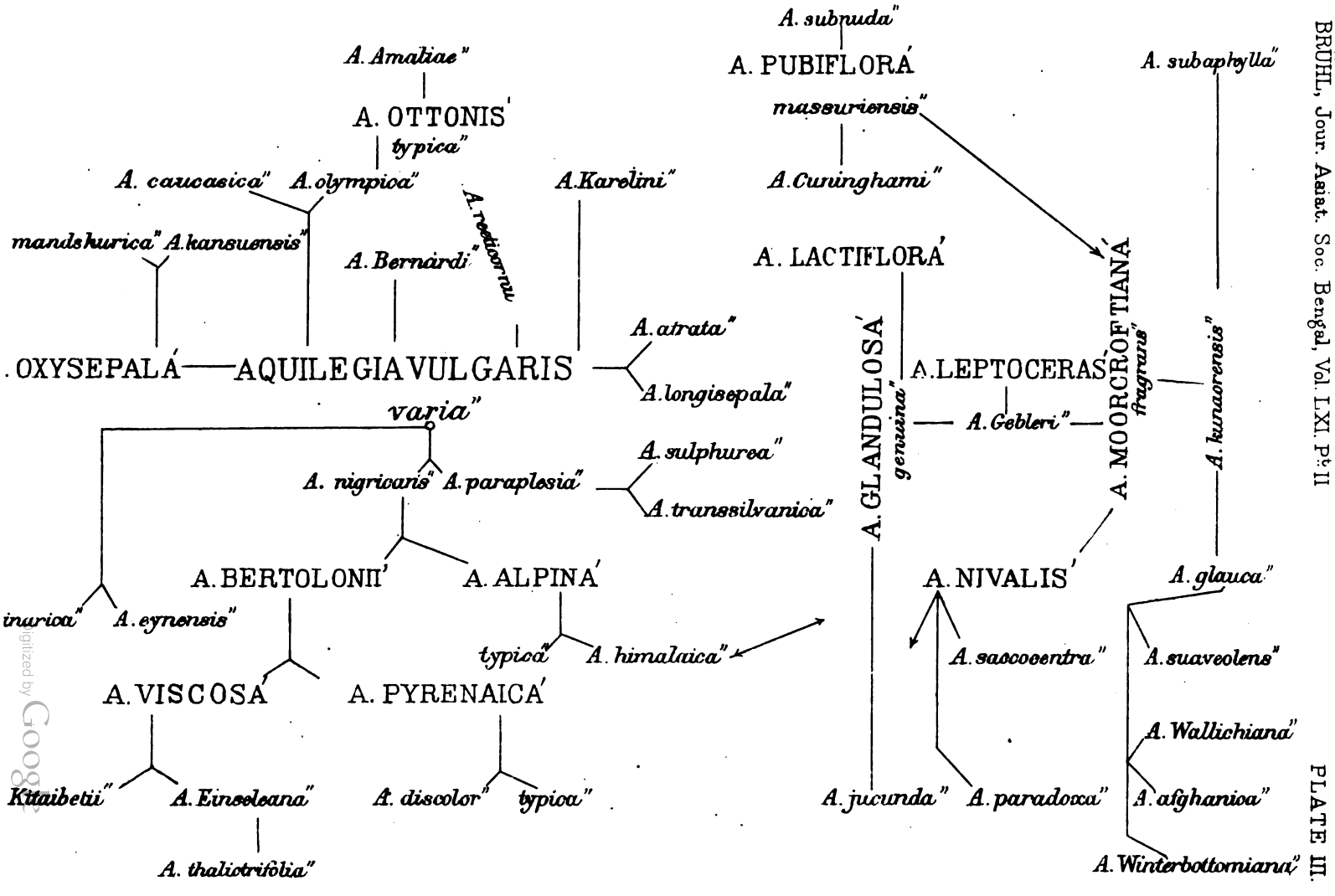


PLATE III.

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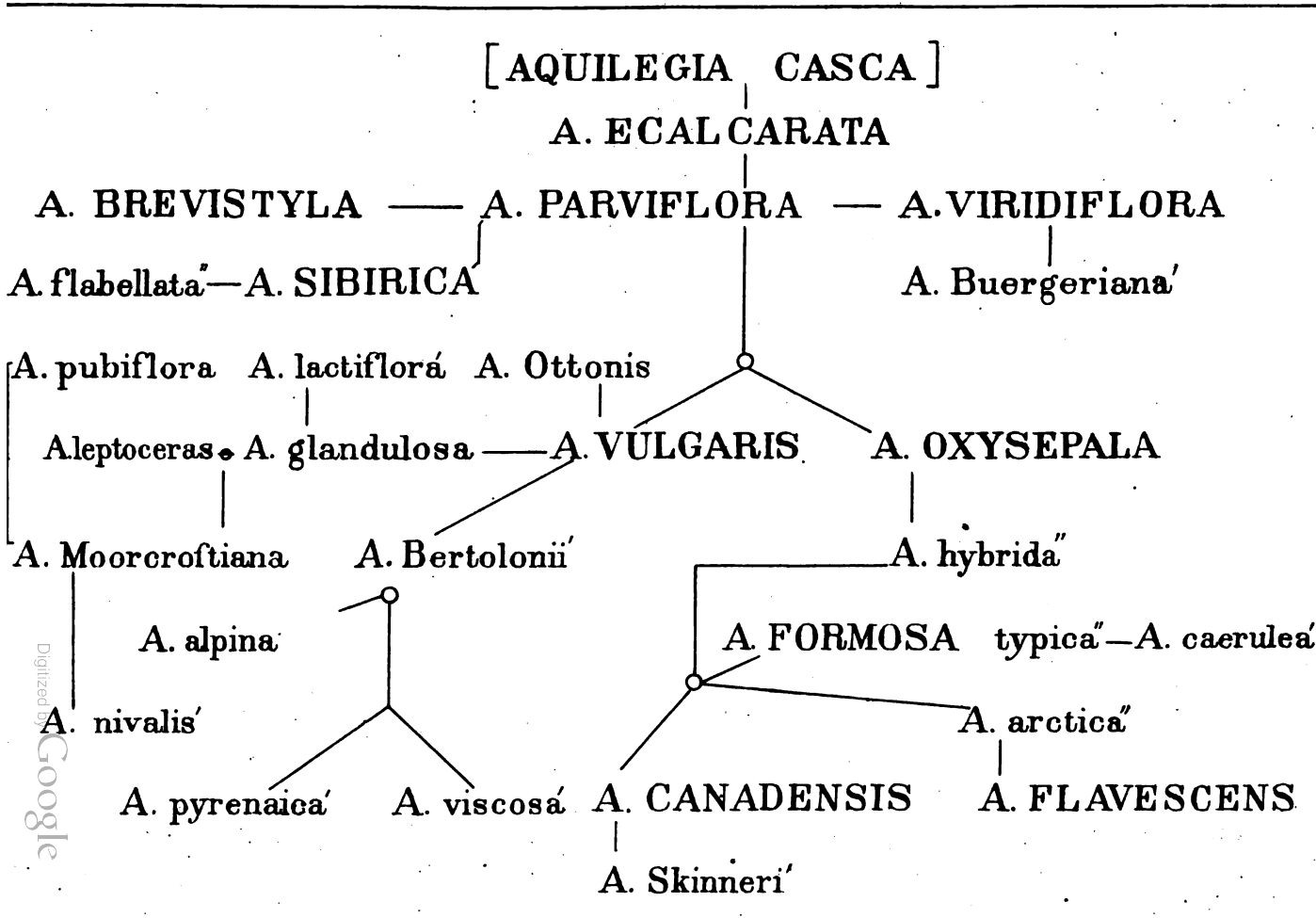




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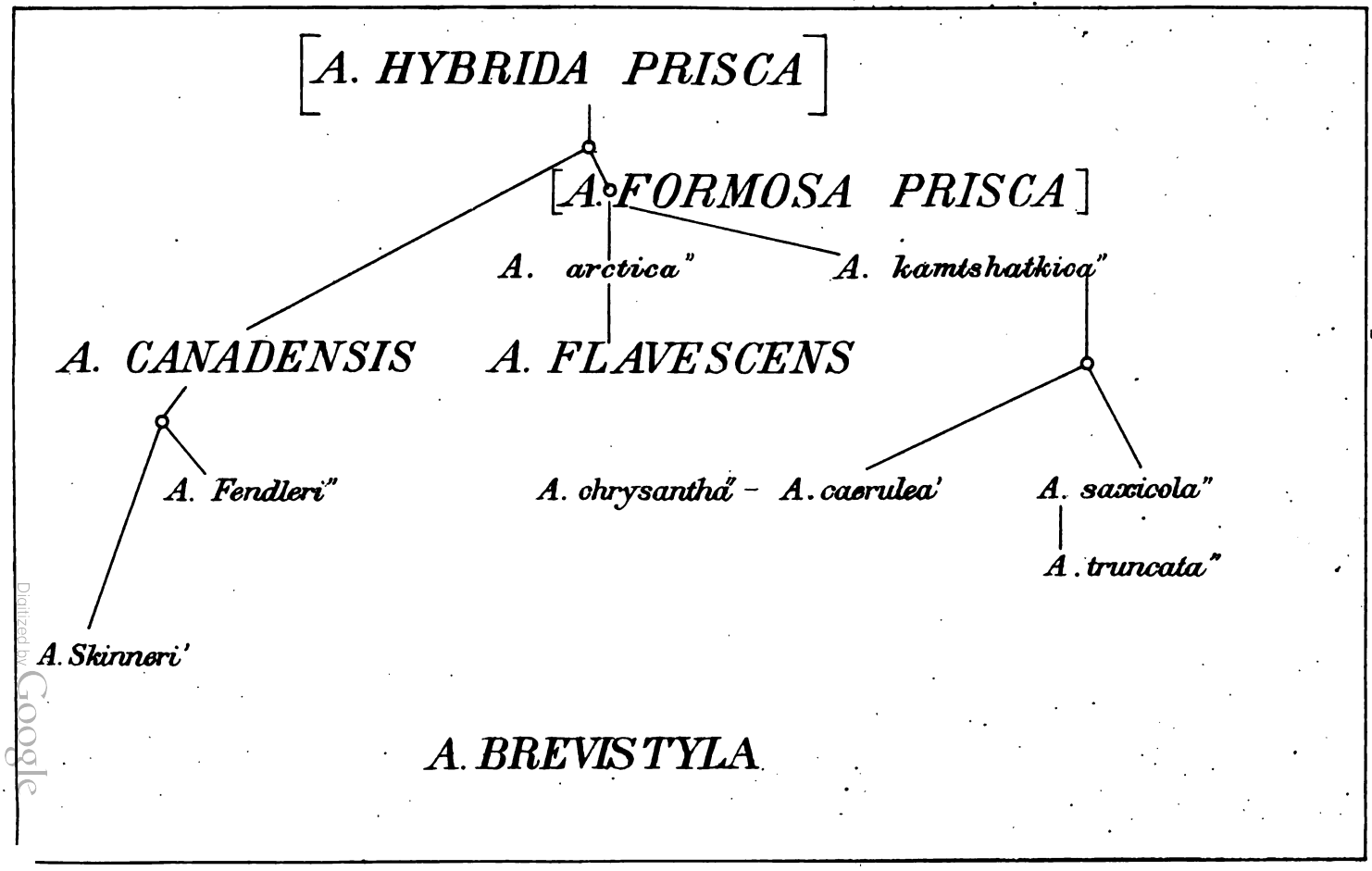




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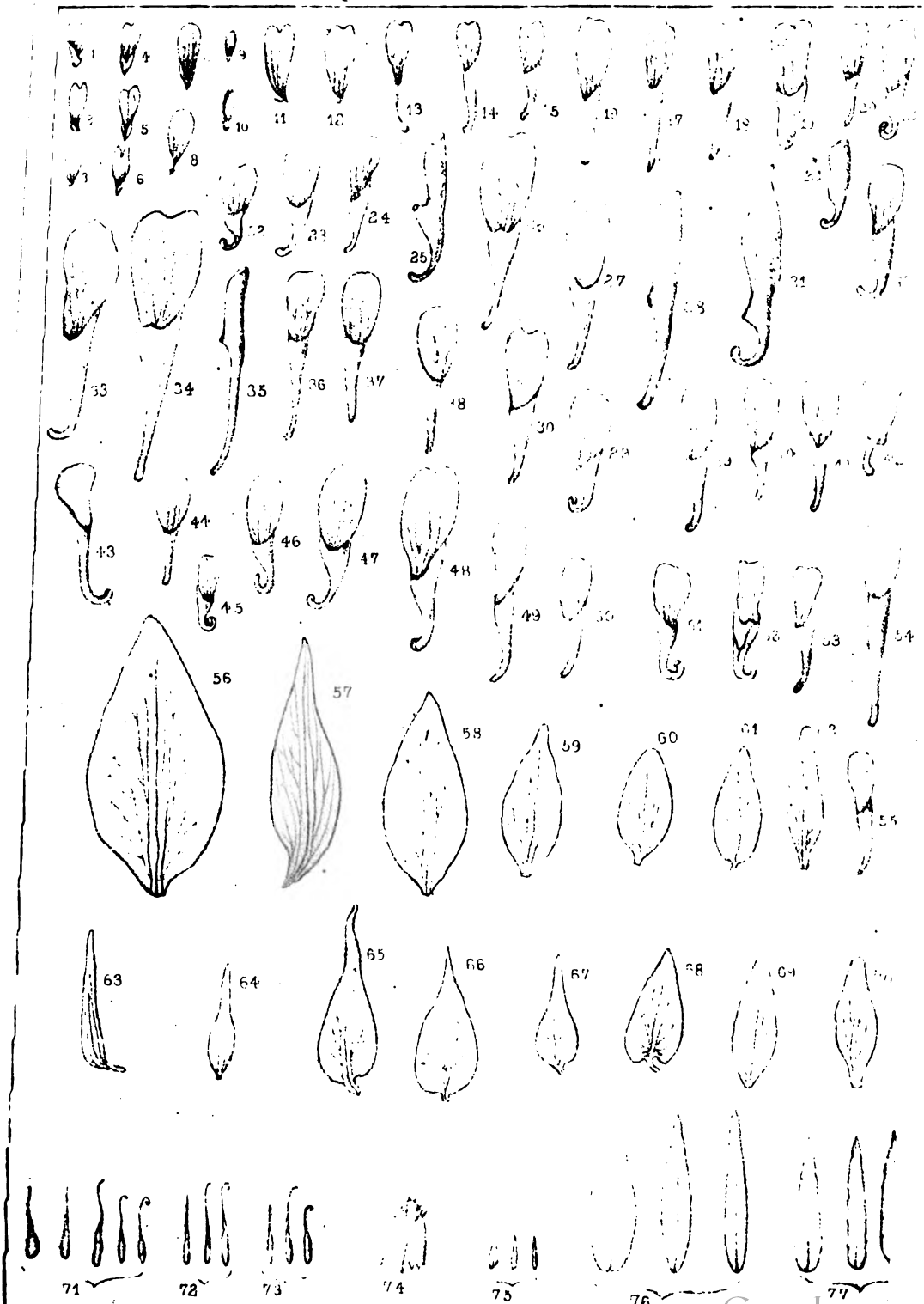


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# INDEX.

Names of New Genera and Species have an asterisk (*) prefixed.


ACALYPTERICTI, 207
*Acanthipeza*, 222
„ *maculifrons*, 222
*Acanthoneura*, 221
„ *maculipennis*, 221
*Acanthonevra*, 225
„ *fuscipennis*, 225
*Acarus*, 236
*Acemyia*, 183
*Achanthiptera*, 204
*Achias*, 191, 221
„ *horsfieldii*, 191, 221
„ *ichneumonea*, 191
„ *oculatus*, 191
ACHIASIDÆ, 191
*Acidia*, 227
„ *quadrincisa*, 227
„ *soror*, 227
*Acinia*, 226
„ *faciestriata*, 227
ACIPHOREÆ, 216, 223
*Aciura*, 227
*Aconitum*, 272
„ *Napellus*, 271, 272
*Acromyia*, 155
*Actia*, 186
*Acurana*, 148, 149
„ *sexfasciata*, 148, 149
*Adapsilidi*, 219
*Adia*, 204
*Adrama*, 222
„ *selecta*, 222
*Agastrodes*, 223
„ *niveitarsis*, 223
*Agonosoma*, 155
*Agria*, 189, 190
*Agromyza*, 233
„ *tristella*, 234
AGROMYZIDES, 232
AGROMYZINA, 232
AGROMYZINÆ, 232
*Alcimus*, 142
„ *hospes*, 142
„ *rufibarbis*, 143
*Allocotosia*, 139
„ *aurata*, 139
„ *triangulum*, 139
*Allographa*, 177
*Alphonsea*, 4, 124
* „ *Curtisii*, 125, 127
*Alphonsea, cylindrica*, 125, 127
„ *elliptica*, 125
* „ *lucida*, 125, 126
„ *Maingayi*, 125
* „ *sub-dehiscens*, 125, 126, 127
*Alternata*, 175
*Aminta*, 207
*Anastœchus*, 163
„ *longirostris*, 163
*Anaxagorea*, 3, 67, 69
„ *fruticosa*, 68
„ *javanica*, 69
„ *luzonensis*, 68, 69
* „ *Scortechinii*, 68
„ *sumatrana*, 21
„ *zeylanica*, 68
*Ancylosyrphus*, 167, 175
„ *salviæ*, 167
*Andrenosoma*, 149
„ *æqualis*, 148
„ *crassipes*, 149
„ *formio*, 148
„ *fusifera*, 149
ANEMPODIATA, 133
*Anœropsis*, 191
ANOMALOCERATI, 234
*Anona*, 2
*Anonacea*, 74, 85
ANONACEÆ, 1, 89, 90
*Anthomyia*, 196, 203, 204, 205, 207
„ *aliena*, 205
„ *bibax*, 204
„ *bina*, 204
„ *bisetosa*, 205
„ *calens*, 204
„ *canicularis*, 207
„ *chalcogaster*, 203
„ *detracta*, 205
„ *exigua*, 204
„ *flexa*, 204
„ *illocata*, 205
„ *indica*, 205
„ *indicata*, 205
„ *leuticeps*, 205
„ *lobalis*, 205
„ *metallica*, 202
„ *nigra*, 204
„ *perœ*, 205
„ *quadrata*, 204
„ *tonitrui*, 204




Digitized by Google

*Anthomyia, trina*, 204
*Anthomyza*, 203, 204, 205
ANTHOMYZIDÆ, 192
ANTHOMYZIDÆ, 203
ANTHRACIDÆ, 159
ANTHRACIDES, 159
ANTHRACIENS, 159
ANTHRACII, 159
ANTHRACINI, 153, 159
*Anthrax*, 159, 160
„ *absalon*, 161
„ *albida*, 161
„ *albo-fulva*, 161
„ *alexon*, 162
„ *aperta*, 161
„ *appendiculata*, 161
„ *argyropyga*, 160
„ *auriplena*, 161
„ *basifascia*, 162
„ *bimacula*, 162
„ *bipunctata*, 160
„ *carbo*, 162
„ *carbonaria*, 161
„ *clara*, 161
„ *collaris*, 162
„ *combinata*, 162
„ *degenera*, 162
„ *dia*, 160
„ *distigma*, 160
„ *dives*, 162
„ *doryca*, 159
„ *duvaucelii*, 161
„ *fulvula*, 161
„ *hyalina*, 160
„ *instituta*, 161
„ *insulata*, 161
„ *lar*, 160
„ *limpida*, 161
„ *lucens*, 160
„ *lucida*, 161
„ *manifesta*, 161
„ *pennipes*, 159
„ *purpuraria*, 161
„ *referens*, 161
„ *ruficollis*, 162
„ *satellitia*, 162
„ *satyrus*, 161
„ *semilucida*, 161
„ *semiscita*, 160
„ *sphinx*, 160
„ *tantalus*, 160
„ *troglodyta*, 160
*Anticheta*, 208
*Antipalus*, 146
„ *wieneckii*, 146
*Aphritis*, 166
*Aporomyia*, 186
*Apterina*, 232
*Aquilegia*, 272, 273, 274, 275, 276, 277, 282, 283, 307, 316, 317, 318, 419, 322
*Aquilegia, alpina*, 275, 276, 277, 278, 279, 281, 282, 283, 284, 293, 294, 296, 314, 315, 316, 323
„ „ *var. himalaica*, 284, 294
„ „ „ *typica*, 281, 284, 294, 323
„ *Amaliae*, 282, 283, 312
„ *arctica*, 317, 318
„ *atrata*, 277, 279, 233, 287, 288
„ *aurea*, 284, 302, 303
„ *Bauhini*, 274, 284, 296
„ *Bernardi*, 284, 287
„ *Bertolonii*, 275, 276, 277, 279, 281, 282, 283, 284, 290, 295, 296, 307, 313, 314, 323
„ *brevistyla*, 275, 282, 316, 317, 319, 320, 321
„ „ *var. leiocarpa*, 319
„ „ „ *vera*, 319
„ *caerulea*, 277, 278, 282, 318, 319, 320
„ „ *var. typica*, 279
„ *canadensis*, 275, 276, 278, 279, 282, 286, 317, 318, 319, 320, 321, 322
„ „ *var. Fendleri*, 320
„ „ „ *Skinneri*, 320
„ „ „ *typica*, 318, 319, 320
„ „ „ *vera*, 320
„ *casca*, 317
„ *caucasica*, 283, 284, 287
„ *chrysantha*, 282, 318, 319
„ *dinarica*, 275, 284, 287, 289
„ *discolor*, 283, 284
„ *Ebneri*, 275, 277, 278, 283, 284, 287, 289
„ *ecalcarata*, 316, 317, 321, 323
„ *Einseleana*, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 296
„ *eynensis*, 296
„ *flavescens*, 282, 319, 320, 321 322
„ *formosa*, 277, 279, 280, 282, 317, 318, 319, 321, 322
„ „ *var. arcticdela*, 319
„ „ „ *caerulea*, 320
„ „ „ *chrysantha*, 320
„ „ „ *Kamtshatica*, 320
„ „ „ *macrantha*, 320
„ „ „ *saxicola*, 320
„ „ „ *truncata*, 320
„ „ „ *vera*, 319, 320, 321
„ „ 271, 273, 275, 277, 278, 279, 280, 281, 282, 283, 284, 304, 305, 306
„ *Fussii*, 284, 302, 303
„ *Gebleri*, 284, 302

Digitized by Google

*Aquilegia, glandulosa*, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 296, 302, 303, 314, 316, 323
„ „ *var. discolor*, 302
„ „ „ *Gebleri*, 284, 303
„ „ „ *genuina*, 279, 284
„ „ „ *jucunda*, 284, 302
„ „ „ *sulphurea*, 284, 303
„ „ „ *transsilvanica*, 284, 303
„ „ „ *typica*, 279, 303, 323
„ „ „ *vera*, 303
„ *glauca*, 279, 280, 282, 283, 284, 304
„ „ *var. nivalis*, 301
„ *glaucophylla*, 287
„ *grata*, 276, 277, 284, 285, 299, 315
„ *Haenkeana*, 287, 290
„ *himalaica*, 319
„ *hybrida*, 286, 317, 318
„ *jucunda*, 279, 280, 281, 283, 284, 302, 303, 323
„ *Karelini*, 324
„ *Kitaibelii*, 274, 276, 277, 278, 280, 284, 296
„ *Kunaorensis*, 275, 278, 283, 304, 306, 324
„ „ *var. suaveolens*, 277, 278, 279, 280, 281, 283, 305
„ *lactiflora*, 283, 284, 310, 315
„ *leptoceras*, 275, 276, 280, 282, 283, 284, 309, 316
„ *longisepala*, 277, 284, 287, 288
„ *Magellensis*, 313
„ *mandshuricis*, 282
„ *Moorcroftiana*, 271, 273, 274, 276, 277, 279, 280, 281, 282, 283, 284, 291, 294, 296, 297, 304, 306, 308, 313, 315, 316, 324
„ „ *var. afghanica*, 284, 307, 309
„ „ „ *fragrans*, 284, 305, 308, 314, 323
„ „ „ *glauca*, 284, 306, 309
„ „ „ *Kunaorensis*, 284, 306, 309, 310, 323, 324
„ „ „ *suaveolens*, 284, 294, 305, 309, 323, 324
*Aquilegia Moorcroftiana, var. subaphylla*, 284, 307, 309
„ „ „ *typica*, 278, 279, 280, 281
„ „ „ *Wallichiana*, 284, 306, 309
„ „ „ *Winterbottomiana*, 284, 305, 309, 313
„ *nevadensis*, 284, 313
„ *nigricans*, 275, 277, 278, 279, 280, 283, 284, 287, 288, 290, 291, 296, 323
„ *nivalis*, 275, 276, 277, 279, 280, 281, 283, 284, 294, 299, 300, 314, 316, 323, 324
„ „ *var. paradoxa*, 274, 284, 301, 323
„ „ „ *saccocentra*, 284, 294, 301, 323
„ *olympica*, 282, 284, 287
„ *Ottonis*, 280, 284, 285, 312
„ „ *var. Amaliæ*, 285, 313, 315
„ „ „ *typica*, 285, 313, 315
„ *oxypetala*, 285
„ *oxysepala*, 275, 276, 278, 279, 281, 282, 283, 284, 285, 286, 313, 317, 318, 319, 321, 322
„ „ *var. kansuensis*, 284, 285
„ „ „ *mandshurica*, 284, 285
„ *paraplesia*, 284, 287, 290
„ *parviflora*, 282, 317, 321, 323
„ *pubiflora*, 273, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 306, 310, 314, 315, 323, 324
„ „ *var. Cunninghami*, 284, 311
„ „ „ *humilior*, 306
„ „ „ *Massuriensis*, 284, 311
„ „ „ *subnuda*, 285, 311
„ *pyrenaica*, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 290, 294, 295 296, 299, 312, 313, 315, 316, 323, 324
„ „ „ *decipiens*, 290, 296
„ „ „ *discolor*, 284 285, 299
„ „ „ *genuina*, 278 285

Digitized by Google

*Aquilegia pyrenaica, var. typica*, 278, 279, 280
„ „ „ *vera*, 299
„ *Reuteri*, 284, 295
„ *sibirica*, 275, 282, 317, 319, 321
„ *Skinneri*, 279, 282, 319, 320, 321
„ *Sternbergii*, 284, 287, 288, 290
„ *suaveolens*, 277
„ *subalpina*, 284, 287, 289
„ *sulphurea*, 284, 302
„ *thalictrifolia*, 274, 276, 277 279, 280, 282, 296, 297, 309
„ *transsilvanica*, 279, 284, 302, 303
„ *truncata*, 318, 319
„ *viridiflora*, 279, 280, 282, 306, 317, 321, 323
„ *viscosa*, 274, 275, 276, 277, 282, 283, 284, 296, 315
„ „ *var. Einseleana*, 284, 297, 323
„ „ „ *Kitaibelii*, 285, 297
„ „ „ *thalictrifolia*, 284, 297
„ „ „ *typica*, 297
„ *vulgaris*, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 285, 286, 287, 290, 312, 313, 314, 316, 318, 319, 321, 322, 323
„ „ *var. alpina*, 293, 305
„ „ „ *atrata*, 284, 288, 293
„ „ „ *Bernardi*, 284, 287, 292, 314
„ „ „ *caucasica*, 284, 287, 292
„ „ „ *dinarica*, 284, 289, 293
„ „ „ *Ebneri*, 284, 289, 293
„ „ „ *eynensis*, 284, 290 293, 324
„ „ „ *fragrans*, 306
„ „ „ *genuina*, 278, 281
„ „ „ *grandiflora*, 305
„ „ „ *Karelini*, 274, 275, 283, 284, 288, 293, 316, 324
„ „ „ *longisepala*, 284, 288, 292
„ „ „ *Moorcroftiana*, 271, 306
„ „ „ *nigricans*, 284, 290, 293
„ „ *olympica*, 284, 287, 292
„ „ „ *ozysepala*, 285
„ „ „ *paraplesia*, 284, 290, 293
„ „ „ *pubiflora*, 301
*Aquilegia vulgaris, var. pyrenaica*, 305
„ „ „ *resticornu*, 284, 289, 293, 315, 324
„ „ „ *typica*, 274, 275, 276, 278, 279, 280, 284, 287, 289, 290, 292, 313, 316
„ „ „ *varia*, 276, 284, 289, 293, 313, 316
„ *Wallichiana*, 306
„ *Winterbottomiana*, 297
*Argyra*, 158
„ *spinipes*, 158
*Argyromœba*, 160
„ *distigma*, 160
„ *melania*, 160
„ *semiscita*, 160
*Argyrospila*, 159
*Aricia*, 203, 204, 205, 207
„ *argentata*, 203
„ *inaperta*, 203
„ *patula*, 203
*Arina*, 208
*Artabotrys*, 3, 28, 30, 37, 38
* „ *costatus*, 31, 37
„ *crassifolius*, 31, 38
* „ *gracilis*, 31, 35
* „ *grandifolius*, 30, 31, 38
* „ *Lowianus*, 31, 34
„ *macrophyllus*, 31, 37
„ *Maingayi*, 31, 35
„ *malayana*, 121
* „ *oblongus*, 31, 33
* „ *oxycarpus*, 31, 34
„ *parviflora*, 37
„ *pleurocarpus*, 30, 32
„ *pleurogynus*, 34
„ *polygynus*, 32, 35
* „ *Scortechinii*, 30, 32
„ *speciosus*, 31, 35
„ *suaveolens*, 31, 36
* „ *venustus*, 30, 32
„ *Wrayi*, 31, 37
*Ascia*, 166
„ *brachystoma*, 166
ASILIDÆ, 139
*Asilus*, 134, 135, 139, 141, 142, 143, 144, 146, 147, 150, 154, 155
„ *agilis*, 145, 147
„ *agnitus*, 142
„ *albibarbis*, 145
„ *anicius*, 141
„ *annulatus*, 144
„ *apicata*, 146
„ *appendiculatus*, 145
„ *armatipes*, 145
„ *atratulus*, 144
„ *aurata*, 139

Digitized by Google

*Asilus, barbatus*, 146
„ *barium*, 146
„ *bengalensis*, 145
„ *bifidus*, 145
„ *chinensis*, 144
„ *claripes*, 145
„ *congedus*, 146
„ *contortus*, 146
„ *debilis*, 146
„ *ephippium*, 145
„ *flagrans*, 146
„ *flavicornis*, 145
„ *fraternus*, 147
„ *fusiformis*, 146
„ *garnoti*, 140
„ *gobares*, 141
„ *griseus*, 147
„ *iamenus*, 146
„ *javanus*, 142
„ *latifascia*, 146
„ *latro*, 147
„ *limbipennis*, 145
„ *lineosus*, 146
„ *loetus*, 145
„ *longistylus*, 147
„ *maculatus*, 142
„ *maculifemora*, 145
„ *melanurus*, 146
„ *minusculus*, 146
„ *misao*, 145
„ *nigrimystaceus*, 145
„ *nudipes*, 145
„ *paterculus*, 146
„ *penultimus*, 146
„ *perplexus*, 142
„ *præfiniens*, 146
„ *pusio*, 145
„ *rufibarbis*, 145
„ *shalumus*, 146
„ *sundaicus*, 145
„ *trifarius*, 145
ASTHENINA, 232
*Atomaria, punctiplena*, 220
*Atomogaster*, 204
*Atomosia*, 148
„ *halictides*, 148
„ *purpurata*, 148
*Azona*, 169
„ *volucelloides*, 170
*Azelia*, 204
*Azelidæ*, 203
*Baccha*, 166
„ *amphithœ*, 166
„ *gratiosa*, 167
„ *maculata*, 166
„ *pedicellata*, 167
„ *sapphirina*, 166
„ *tripartita*, 166
„ *vittata*, 166
*Bactrocera*, 217
„ *fasciatipennis*, 217
*Bactrocera, maculipennis*, 217
*Baryterocera*, 174
„ *inclusa*, 174
*Bengalia*, 195
„ *dioclea*, 195
„ *labiata*, 195
„ *lateralis*, 195
„ *melanocera*, 195
„ *pallens*, 195
„ *testacea*, 195
*Besseria*, 191
*Bibio*, 133, 154, 155, 160, 234
„ *satyrus*, 161
„ *sphinx*, 159
*Bigonicheta*, 18
*Blainvillia*, 203, 220
*Blepharella*, 186
„ *lateralis*, 186
*Blepharipa*, 181, 182
*Blepharipeza*, 182
„ *indica*, 182
„ *thermophila*, 182
*Blepharipoda*, 182
*Blondelia*, 182
*Bocagea*, 7, 79, 124
„ *elliptica*, 7
„ *hexandra*, 82
„ *pisocarpa*, 89
„ *polycarpa*, 185
*Boisduvalia*, 225
„ *rutilans*, 220, 225
*Bombibia*, 164
BOMBYLIDÆ, 153, 159
*Bombylius*, 162, 163
„ *ardens*, 162
„ *maculatus*, 162
„ *orientalis*, 162
„ *pulchellus*, 162
„ *socius*, 162
„ *tricolor*, 162
*Bonga Cananga*, 39
BORBORINÆ, 231, 232
*Borborus*, 231
„ *punctipennis*, 232
*Bothria*, 182
*Brachyglossum*, 164
*Brachyopa*, 217
*Byomya*, 201
*Calliope*, 229
*Calliphora*, 196, 197, 198, 200
„ *fulviceps*, 196
„ *rufipes*, 196
*Calliprobola*, 165
*Calobata*, 212, 213, 214
„ *albimana*, 212
„ *albitarsis*, 212
„ *basalis*, 212
„ *cedens*, 212
„ *confinis*, 212
„ *contracta*, 212
„ *cyanescens*, 212

Digitized by Google

*Calobata, immixta*, 212
„ *leucopeza*, 212
„ *morbida*, 212
„ *prudens*, 212
„ *splendens*, 212
„ *strenua*, 212
„ *stylophora*, 212
„ *vidua*, 212
CALOBATIDÆ, 211
*Caltha palustris*, 271, 272
CALYPTERATÆ, 179
CALYPTERICTI, 178
*Camilla*, 231
*Campylocera*, 218
„ *myopina*, 218
„ *robusta*, 218
*Campylocheta*, 182
*Cananga*, 12, 39, 40, 41
„ *monosperma*, 41, 42
„ *odorata*, 39, 40, 41
„ *ouregow*, 40
„ *sylvestris*, 39, 40
„ „ *var. angustifolia*, 40
„ „ „ *latifolia*, 40
„ „ „ *trifoliata*, 40
„ *virgata*, 29, 41
*Canangium*, 3, 39, 40
„ *odoratum*, 41, 42
„ *Scortechinii*, 41, 42
CAPROMYZINÆ, 232
*Carcelia*, 168
*Cardiacephala*, 214
„ *longicollis*, 214
*Caricea*, 205, 206
„ *leptosoma*, 206
*Carpomyia*, 224
CARPOMYZÆ, 214, 216, 223
*Cartosyrphus*, 168
„ *pilipes*, 168
*Carulia*, 181
*Catabomba*, 175
*Catapicephala*, 189, 196
„ *splendens*, 189, 196
*Catilia*, 187
*Celeripes*, 236
*Celyphus*, 228
„ *fuscipes*, 228
„ *levis*, 228
„ *obtectus*, 228
„ *scutatus*, 228
*Cephalia*, 214, 215
„ *bicolor*, 214
*Cephalops*, 163
*Cerais*, 233
„ *magnicornis*, 233
*Cerajocera*, 224
*Ceratitis*, 222
„ *capitata*, 222
„ *citriperda*, 222
*Ceria*, 165
„ *eumenioides*, 165
*Ceria, javana*, 165
*Ceromasia*, 181
*Ceyx*, 212
*Chalcidimorpha*, 137
„ *myops*, 137
*Charax*, 222
„ *planidorsum*, 222
*Chatolyga*, 182
*Cheilopogon*, 134
*Chelisia*, 205
*Chelyphora*, 223
„ *borneana*, 223
*Chetina*, 182
*Chetoscra*, 208
*Chetogena*, 182
CHILIZINA, 210, 232
*Chloria*, 228
„ *clausa*, 228
CHLOROPIDÆ, 232
*Chlorops*, 232, 233
„ *confusus*, 233
„ *extraneus*, 232
„ *longicornis*, 233
„ *nicobarensis*, 233
„ *stiolatus*, 232
*Chœades*, 149
„ *aurigena*, 149
*Chortophila*, 204
*Chromatomyia*, 219
*Chrysomya*, 197, 198
„ *chrysoides*, 197
„ *duvaucelii*, 197, 199
„ *flaviceps*, 197
„ *remuria*, 197
„ *tifata*, 197
*Chrysomyza*, 228
*Chrysosoma*, 155
*Chrysotoxum*, 166
„ *antiquum*, 166
„ *baphyrus*, 166
„ *indicum*, 166
*Chrysotus*, 157
„ *chinensis*, 157
„ *rostratus*, 157
CHYLISIDÆ, 229
*Chyliza*, 229
„ *calida*, 230
„ *histrionica*, 229
„ *macularis*, 230
CHYLIZINA, 229
*Citibœna*, 174
„ *aurata*, 174
*Clasiopa*, 232
„ *albitarsis*, 232
*Clematis sikkimensis*, 271
*Cœlomyia*, 207
*Cœlopa*, 229, 233
„ *orientalis*, 229, 233
*Cœnogaster*, 174
*Cœnosia*, 205, 206
„ *boops*, 206

Digitized by Google

*Cœnosia, compressiventris*, 206
„ *falcata*, 206
„ *grata*, 206
„ *insurgens*, 206
„ *leucospila*, 206
„ *loeta*, 206
„ *macularis*, 206
„ *marginata*, 206
„ *modesta*, 206
„ *pulla*, 206
„ *pumila*, 206
„ *simplex*, 206
„ *torrida*, 206
*Colobœa*, 208
*Comastes*, 162
„ *pulchellus*, 162
*Comes spectabilis*, 150
*Compsomyia*, 200
„ *accincta*, 200
„ *cæruleivirens*, 200
„ *dux*, 199
„ *violaceinitens*, 200
*Conicera*, 234
*Conopilla*, 164
*Conopœjus*, 164
*Conops*, 164, 165, 166, 169, 172, 173, 174, 178
„ *annulosus*, 164
„ *calopus*, 164
„ *erythrocephala*, 164
„ *gigas*, 174
„ *javanica*, 164
„ *nubeculosus*, 164
„ *pactyas*, 164
„ *tenellus*, 164
„ *testacea*, 164
CONOPSIDI, 164
CONOPSIDII, 164
*Conopts*, 192
*Consobrina spectabilis*, 150
*Coprina*, 173
*Copromyza*, 229, 231, 232, 233
*Cordyligastor*, 188
„ *fuscifacies*, 188
CORDYLURIDÆ, 210, 229
CORIACEÆ, 234
*Cormansis*, 148
„ *halictides*, 148
*Cosmina*, 194
„ *micans*, 194
„ *pinangiana*, 194
„ *varia*, 194
CREOPHILAS, 179
*Crossotocnema*, 187
„ *javana*, 187
*Crumomyia*, 232
CRYPTOCERES, 234
CUCURBITACEÆ, 41
*Curtonevra*, 196
„ *pruinosa*, 196
*Cyathocalyx*, 2, 28, 30, 38, 41
*Cyathocalyx, Maingayi*, 28, 29
„ *virgatus*, 28
*Cyathostemma*, 2, 8, 11
* „ *acuminatum*, 8, 11
* „ *Hookeri*, 8, 10
* „ *Scortechinii*, 8, 9, 11
„ *viridiflorum*, 8, 9
* „ *Wrayi*, 8, 9
*Cynomyia*, 190, 196
„ *fortis*, 190
„ *fulviventris*, 190
„ *quadrivittata*, 196
„ *violacea*, 190, 196
*Cyrtopogon*, 138
„ *laphrides*, 138
„ *scatophagoides*, 138
*Dactyliscus*, 138
*Dacus*, 209, 217, 218, 221, 224, 226
„ *ænea*, 218
„ *caudata*, 221
„ *cruz*, 224
„ *cylindricus*, 217
„ *fascipennis*, 217
„ *ferrugineus*, 217
„ *incisus*, 217
„ *Klugii*, 217
„ *limbipennis*, 217
„ *longicornis*, 217
„ *modesta*, 224
„ *ritsemæ*, 217
„ *squalidus*, 217
„ *umbrosus*, 217
*Dalmannia*, 178
*Damalis*, 137
„ *andron*, 137
„ *felderi*, 138
„ *fumipennis*, 137
„ *fuscus*, 137
„ *grossa*, 138
„ *maculata*, 137
„ *major*, 137
„ *marginata*, 137
„ *myops*, 137
„ *pallida*, 138
„ *planiceps*, 137
„ *saigonensis*, 137
„ *signatus*, 137
„ *tibialis*, 137
DANAINÆ, 241
*Dasyllis*, 149
„ *gigas*, 149
DASYMASCHALON, 43, 111
*Dasyna*, 229
*Dasyneura*, 221
„ *caudata*, 221
„ *tau*, 221
„ *zonata*, 221
*Dasypogon*, 134, 135, 136, 138, 139, 155
„ *albonotatus*, 134
„ *ambryon*, 134
„ *aphrices*, 134

Digitized by Google

*Dasypogon*, *apicalis*, 136
„ *apiformis*, 134
„ *aurata*, 139
„ *balbilus*, 135
„ *bifidus*, 145
„ *cerco*, 134
„ *chinensis*, 140
„ *damias*, 134
„ *decretus*, 135
„ *dorsalis*, 134
„ *dux*, 136
„ *echelus*, 135
„ *hypsaon*, 134
„ *imberbis*, 134
„ *imbrex*, 135
„ *imbutus*, 134
„ *incisus*, 134
„ *inopinatus*, 135
„ *inopportunus*, 135
„ *lanatus*, 135
„ *libo*, 135
„ *nigricauda*, 134
„ *otacilius*, 135
„ *pekinense*, 134
„ *polygnotus*, 135
„ *proclivis*, 135
„ *pulverifer*, 134
„ *rhypæ*, 135
„ *scatophagoides*, 135
„ *sinense*, 136
„ *sordidus*, 134
„ *subauratus*, 134
„ *sura*, 135
„ *trimelas*, 134
„ *virens*, 134
„ *volcatus*, 134
DASYPOGONIDÆ, 133
DASYPOGONINA, 133
*Degeeria*, 182
„ *albipes*, 182
*Delia*, 204
*Delphinium*, 272
„ *camptocarpum*, 271
„ *Napellus*, 271
„ *persicum*, 271
*Desmos*, 43
„ *chinensis*, 45
„ *cochin-chinensis*, 44
*Dexia*, 187, 188, 189
„ *chlöe*, 188
„ *divergens*, 187
„ *extendens*, 187
„ *festiva*, 187
„ *javanensis*, 187
„ *lepida*, 187
„ *macropus*, 187
„ *munda*, 187
„ *subcompressa*, 187
DEXIDÆ, 187
*Dexilla*, 187
DEXINÆ, 187, 188
*Dialineura*, 154
*Diaphorus*, 158
„ *æneus*, 158
„ *delegatus*, 158
„ *mandarinus*, 158
*Diateina*, 213
*Didea Ellenziederi*, 175
„ *macquarti*, 167
*Dioctria*, 137
„ *albonotatus*, 134
DIOPSIDÆ, 215
*Diopsis*, 215, 216
„ *apicalis*, 216
„ *attenuata*, 215
„ *belzebuth*, 216
„ *circularis*, 215
„ *dalmanni*, 215
„ *discrepans*, 215
„ *dubia*, 216
„ *graminicola*, 216
„ *ichneumonea*, 215
„ *indica*, 215
„ *latimana*, 215
„ *lativola*, 215
„ *quinqueguttata*, 215
„ *subfasciata*, 215
„ *sykesii*, 216
„ *villosa*, 216
„ *westwoodii*, 215
*Diospyros frondosa*, 7
*Diplogaster*, 204
„ *nigricauda*, 204
DIPTERA, 133
DIPTEROCARPEÆ, 1
DISCIFLORÆ, 1
*Discocerina*, 232
*Discomyza*, 231
„ *pelagica*, 231
„ *punctipennis*, 231
*Disepalum*, 1, 3, 69
„ *anomalum*, 69
„ *longipes*, 69
*Ditomogaster*, 220
„ *xanthomera*, 220
*Doleschalla*, 189
„ *nigra*, 189
„ *picta*, 189
DOLICHOCERA, 210
DOLICHOPODÆ, 155
*Dolichopus*, 157, 158, 229
„ *alligatus*, 158
„ *collectus*, 158
„ *electus*, 158
„ *fuscipennis*, 158
„ *nitens*, 156
„ *ziczac*, 158
*Dorbinia*, 186
*Doria*, 182
*Drepananthus*, 3, 38
„ *pruniferus*, 38, 39
„ *ramuliflorus*, 38, 39

Digitized by Google

*Drepananthus, stenopetala*, 119
*Drosophila*, 231
„ *insulana*, 231
„ *lineata*, 231
„ *nigriventris*, 231
DROSOPHILIDÆ, 231
*Dryomyza*, 209
„ *maculipennis*, 209
DRYOMYZINÆ, 208
*Dryope*, 209
*Dryæo*, 230
„ *lispoidea*, 230
*Duvaucelia*, 179, 191
„ *bicincta*, 179, 191
*Dyctia*, 208, 211, 220
„ *decora*, 218
*Dyseris*, 148
*Echinomyia*, 180
„ *brevipennis*, 180
„ *flavopilosa*, 180
„ *javana*, 180
„ *lithanthrax*, 180
„ *platymesa*, 180
„ *rufo-analis*, 180
„ *sacontala*, 180
„ *tepens*, 180
„ *varia*, 180
*Egeria*, 204
*Egle*, 204
*Elachigaster*, 220
„ *albitarsis*, 220
*Elasmocera*, 138
*Ellipeia*, 2, 24
„ *costata*, 24, 26
„ *cuneifolia*, 24, 25, 28
„ *glabra*, 24, 26
* „ *leptopoda*, 24, 25
„ *nervosa*, 25, 27
„ *parviflora*, 56
* „ *pumila*, 24, 27
„ *undulata*, 56
*Elophilus*, 169, 172
*Emphysomera*, 139
„ *conopsoides*, 139
„ *femorata*, 139
„ *nigra*, 139
„ *nigrifemorata*, 139
„ *peregrina*, 139
„ *spathulata*, 139
EMPIDÆ, 154
*Empis*, 155
*Endoiasimyia*, 168
„ *indiana*, 168
*Enicita*, 214
*Eniconevra*, 220
„ *fenestralis*, 220
*Enicoptera rufiventris*, 222
*Enicopus*, 214
*Ensina*, 226
„ *guttata*, 226
„ *reticulata*, 226
ENTOMOBIÆ, 179
EPHDRINIDÆ, 230
EPHIDRINA, 230, 232
*Epiceia*, 155
*Epidesmia*, 227
*Erax*, 134, 144
„ *curiatius*, 144
„ *rufiventris*, 144
„ *sinensis*, 144
*Erigone*, 181
*Eriozona*, 175
*Eristalinus*, 169
*Eristalis*, 165, 168, 169, 171, 172, 173, 231
„ *æsepus*, 170
„ *æsymnus*, 170
„ *albibasis*, 171
„ *amphicrates*, 168
„ *andræmon*, 170
„ *antidotus*, 170
„ *argyrocephalus*, 170
„ *arvorum*, 169
„ *barbatus*, 171
„ *bengalensis*, 169, 172
„ *cerealis*, 169
„ *chalcopygus*, 170
„ *chrysopygus*, 168
„ *cognatus*, 169
„ *curvipes*, 171
„ *dentipes*, 170
„ *errans*, 168
„ *exterus*, 170
„ *flavofasciatus*, 168
„ *javanus*, 170
„ *latus*, 170
„ *lætus*, 169
„ *macquarti*, 168
„ *maxima*, 170
„ *multifarius*, 170
„ *niger*, 169
„ *nitidus*, 171
„ *obliquus*, 169
„ *ægrotus*, 175
„ *orientalis*, 169
„ *pallinervis*, 170
„ *proserpina*, 169
„ *quadrilineatus*, 169
„ *quadristriatus*, 170
„ *quadrivittatus*, 169
„ *quinquefasciatus*, 171
„ *quinquelineatus*, 171
„ *quinquestriatus*, 169
„ *sinensis*, 169
„ *singularis*, 171
„ *solitus*, 170
„ *sugens*, 169
„ *tarsalis*, 170
„ *tomentosus*, 170
„ *transpositus*, 171
„ *ursinus*, 171
„ *varipes*, 168
„ *ventralis*, 171



Digitized by Google

*Eristalis, vestitus*, 169
„ *vilis*, 169
„ *vinctorum*, 170
„ *violaceus*, 170
„ *zonalis*, 168
*Eristalomyia*, 169, 171
„ *fo*, 171
„ *orientalis*, 171
„ *paria*, 171
„ *picta*, 171
*Eristicus*, 144
*Ernestia*, 181
*Estheria*, 187
*Euleia*, 225, 227
„ *(Trypeta) mutica*, 225
*Eumeros*, 173
*Eumerosyrphus*, 167
„ *indianus*, 167
„ *indicus*, 167
*Eumerus*, 172
„ *albifrons*, 173
„ *aurifrons*, 172
„ *indica*, 173
„ *macrocerus*, 172
„ *nicobarensis*, 173
„ *splendens*, 173
*Eumezoneuron*, 130
*Euphemia*, 203
*Euplœa*, 237, 238, 240, 243, 245
„ *apicalis*, 242, 244
„ *augusta*, 244
„ *burmeisteri*, 244
„ *crassa*, 241, 244
„ *erichsonii*, 238, 241, 243, 244, 245
„ *grantii*, 241
„ *harrisii*, 245
„ *hopei*, 245
„ *illustris*, 241, 244
„ *imperialis*, 244
„ *indigofera*, 244
„ *klugii*, 238, 239, 240, 243, 244, 245
„ *kollari*, 237, 241, 242, 243, 244, 245
„ *linnæi*, 238
„ *macclellandi*, 244
„ *masoni*, 241, 244
„ *midanus*, 238
„ *pembertoni*, 244
„ *regalis*, 244
„ *sherwillii*, 244
„ *sinhala*, 238, 239, 240, 242, 243
„ *uniformis*, 244
„ *(Pademma) erichsonii*, 241
„ „ *klugii*, 240, 241
„ „ *kollari*, 241
„ „ *sinhala*, 240
„ *(Stictoplœa) harrisii*, 245
EUPLŒINA, 239
EUPOLYALTHIA, 51
*Eupteromyia*, 207,
*Eupteromyia, trivittata*, 207
*Eurhina*, 234
„ *albovariegata*, 224
*Eurigaster*, 185, 186
„ *cuprescens*, 185
„ *languida*, 185
„ *muscoides*, 185
„ *subferrifera*, 185
*Eurypalpus*, 218
„ *testaceus*, 218
*Euthycera*, 211
*Exogaster*, 191
*Exoprosopa*, 159, 160
„ *albicincta*, 159
„ *audouinii*, 160
„ *aurantiaca*, 159
„ *bengalensis*, 159
„ *binotata*, 159
„ *brahma*, 159
„ *chrysolampis*, 159
„ *doryca*, 159
„ *flavofasciata*, 159
„ *fuscanipennis*, 160
„ *javana*, 159
„ *pennipes*, 159
„ *sphinx*, 159
*Exorista*, 186
„ *fasciata*, 186
*Fabricia*, 180
*Fannia*, 207
*Faurellia*, 180
*Fausta*, 181
*Fellæa*, 203, 205
*Feronia*, 235
„ *spinifera*, 236
*Fucomyia*, 229, 233
GASTRODEÆ, 179
*Gastrophilus*, 178
„ *bengalensis*, 178
„ *equi*, 178
*Gastrus*, 178
*Gaustellia*, 178
*Gauzania*, 209
„ *devecta*, 209
*Geomyza*, 232
„ *laticosta*, 232
„ *spuria*, 232
GEOMYZIDES, 231
GEOMYZINÆ, 231
*Gomrhynchus*, 178
*Gonia*, 179, 182
„ *atra*, 179
„ *bicincta*, 179
„ *dioclea*, 195
„ *dotata*, 195
„ *indica*, 180, 182
„ *javana*, 180
„ *javanica*, 179
„ *minuta*, 180
„ *œstroides*, 180
„ *rufitibialis*, 180

Digitized by Google

*Gonia, thermophila*, 182
„ *varia*, 194
*Goniothalamus*, 3, 70, 79, 90, 98
* „ *Curtisii*, 70, 75
„ *fulvus*, 70, 74, 79
„ *giganteus*, 70, 73
„ *Griffithii*, 71, 75
„ *Kunstleri*, 70, 73
„ „ *var. marcantha*, 73
„ *macrophyllus*, 71, 76
„ *malayanus*, 70, 74, 79
* „ *Prainianus*, 70, 72
* „ „ *var. angustipetala*, 72
* „ *Ridleyi*, 71, 76
* „ *Scortechinii*, 71, 77
„ *Slingerlandtii*, 74
„ *subevenius*, 70, 71
„ *Tapis*, 71, 77
* „ *tenuifolius*, 70, 71, 72
* „ „ *var. aborescens*, 72
* „ *uvarioides*, 70, 71, 78
* „ *Wrayi*, 71, 78
*Gonypes*, 135
*Grammicomyia*, 213
„ *testacea*, 213
*Graptomyza*, 173, 174
„ *brevirostris*, 174
„ *interrupta*, 174
„ *longirostris*, 174
„ *ornidia*, 174
„ *ventralis*, 173
*Guatteria*, 12, 40, 41, 100
„ *biglandulosa*, 100
„ *canangioides*, 57
„ *caudata*, 118
„ *cinnamomea*, 66
„ *cordata*, 17
„ *elliptica*, 65
„ *fasciculata*
„ *globosa*, 124
„ *hypoglauca*, 53
„ *Jenkinsii*, 57
„ *lateriflora*, 59
„ *macrophylla*, 96, 97
„ *micrantha*, 21
„ *multinervis*, 66
„ *pallida*, 97
„ *Parveana*, 57
„ *pondok*, 67
„ *ramosissima*, 92
„ *simiarum*, 53
„ *sumatrana*, 53
GYMNOLOMÆ, 179
*Gymnopa*, 23
„ *gutticosta*, 231
„ *infusa*, 231
*Gymosoma*, 179
„ *indica*, 179
*Habropogon*, 138
„ *jucundus*, 138
*Habzelia ferruginea*, 121
„ *oœyantha*, 114
HÆMATOMYZÆ, 178
*Harpamerus*, 155
*Helina*, 204
*Helomyza*, 208, 233
„ *æquata*, 208
„ *circumfusa*, 208
„ *exeuns*, 208
„ *fuscicostata*, 208
„ *intereuns*, 208
„ *invicta*, 208
„ *limbata*, 208
„ *maura*, 208
„ *orientalis*, 208
„ *provecta*, 208
HELOMYZINÆ, 208
*Helophilus*, 172, 173
„ *bengalensis*, 172
„ *insignis*, 172
„ *notabilis*, 172
„ *pilipes*, 172
HEMERODROMYDÆ, 154
*Hemigaster*, 220
„ *albovittatus*, 220
*Heramya*, 220
*Herbina*, 208, 209
*Herbstia*, 186
*Herina*, 217
„ *calcarata*, 217
„ *cyaneiventris*, 218
*Hermyia*, 186
„ *alacris*, 186
„ *beelzebub*, 186
„ *imbuta*, 186
*Hesyquillia*, 220
*Heteralonia*, 159
*Heteromyza*, 233
„ *orientalis*, 233
HETEROMYZIDÆ, 232
HETEROMYZIDES, 232, 234
*Heterostoma*, 233
*Hilara*, 155
„ *bares*, 155
HIPPOBOSCIDÆ, 234
*Hippobosca*, 235, 236
„ *calopsis*, 235
„ *francilloni*, 235
„ *sivæ*, 265
„ *variegata*, 235
*Hæmatobia*, 192
*Homalomyia*, 207
„ *canicularis*, 207
*Homalura*, 233
„ *maculipennis*, 233
*Hubneria*, 186
*Hyalostemma Roxburghiana*, 124
*Hybos*, 155
„ *brachialis*, 155

Digitized by Google

*Hybos, gagatinus*, 155
HYBOTIDÆ, 154
HYDRELLIDEÆ, 230
*Hydrochus*, 157
HYDROMYZIDÆ, 230
*Hydrophoria*, 203, 205
*Hydrotæa*, 203
„ *chalcogaster*, 203
„ *solennis*, 203
*Hylemyia*, 205
*Hyperalonia*, 159, 160
„ *audouinii*, 160
„ *fuscanipennis*, 160
„ *œnomœus*, 160
„ *tantalus*, 160
*Hyperechia*, 148
„ *xylocopiformis*, 148
HYPOCERA, 234
HYPOCERIDÆ, 234
HYPODERMINA, 178
*Idia*, 192, 193, 194
„ *bengalensis*, 193
„ *bicolor*, 194
„ *bivittata*, 114
„ *cincta*, 194
„ *discolor*, 193
„ *flavipennis*, 193
„ *flavipes*, 193
„ *fulvipes*, 194
„ *lateralis*, 194
„ *limbipennis*, 194
„ *mandarina*, 193
„ *marginata*, 194
„ *melanostoma*, 193
„ *metallica*, 193
„ *nigricauda*, 194
„ *obsoleta*, 192
„ *quadrimaculata*, 194
„ *quadrinotata*, 193
„ *simplex*, 194
„ *tenebrosa*, 194
„ *testacea*, 193
„ *tripartita*, 194
„ *unicolor*, 194
„ *varia*, 194
„ *xanthogaster*, 193
„ *xanthogastera*, 193
*Imatisma*, 172
„ *orientalis*, 172
*Isamia rothneyi*, 242
„ *sinhala*, 240
*Ischyrosyrphus*, 167, 175
„ *sivæ*, 167
„ *tigerinus*, 167
*Isomera*, 179
*Isopyrum*, 316
„ *biternatum*, 316
„ *grandiflorum*, 316, 323
„ *microphyllum*, 316, 323
*Istocheta*, 182
*Itamus*, 147
*Itamus, dipygus*, 147
„ *fraternus*, 147
„ *griseus*, 147
„ *latro*, 147
„ *longistylus*, 147
*Jurinea*, 179
*Jurinia*, 179
„ *indica*, 179
KENTIA, 41, 106
*Keratocera*, 230
*Kingstonia*, 4, 128
„ *nervosa*, 128
*Lampria*, 149
„ *ænea*, 150
„ *auribarbis*, 149
*Lamprogaster*, 219, 226
„ *basilutea*, 219
„ *divisa*, 219
„ *flavipennis*, 219
„ *frauenfeldi*, 219
„ *glabra*, 219
„ *guttata*, 219
„ *marginifera*, 227
„ *punctata*, 219,
„ *sexvittata*, 227
„ *transversa*, 219, 227
„ *truncatala*, 219
„ *vittata*, 219
„ *zonata*, 219
*Laphria*, 148, 149, 150
„ *abscissa*, 152
„ *ænea*, 150
„ *alternans*, 150
„ *aureola*, 153
„ *barbicrura*, 153
„ *basifera*, 151
„ *basigutta*, 151
„ *bipartita*, 151
„ *blumei*, 153
„ *chrysotelus*, 152
„ *cingulifera*, 152
„ *claripennis*, 151
„ *colorata*, 150
„ *completa*, 152
„ *comptissima*, 152
„ *congrua*, 150
„ *constricta*, 153
„ *crassipes*, 149
„ *cyanea*, 150
„ *detecta*, 152
„ *dira*, 152
„ *diversa*, 153
„ *elegans*, 150
„ *elva*, 152
„ *fervens*, 150, 153
„ *flavifacies*, 151
„ *fulvicrura*, 153
„ *fusifera*, 149
„ *futilis*, 153
„ *gigas*, 149
„ *gravipes*, 153

Digitized by Google

*Laphria hirticornis*, 148
„ *histrionica*, 153
„ *horrida*, 152
„ *ignobilis*, 153
„ *imbellis*, 152
„ *inaurea*, 151
„ *incivilis*, 152
„ *interrupta*, 152
„ *javana*, 151
„ *kollari*, 149
„ *latere-punctata*, 151
„ *lepida*, 152
„ *leucoprocta*, 151
„ *luteipennis*, 151
„ *melania*, 151
„ *mulleri*, 153
„ *notabilis*, 151
„ *orcus*, 151
„ *partita*, 152
„ *plana*, 151
„ *producta*, 150
„ *radicalis*, 151
„ *reinwardti*, 150
„ *rudis*, 152
„ *sæva*, 153
„ *scapularis*, 150
„ *semifulva*, 151
„ *senomera*, 151
„ *seticrura*, 153
„ *shalumus*, 152
„ *signatipes*, 153
„ *sobria*, 151
„ *solita*, 153
„ *spectabilis*, 149, 150
„ *splendida*, 149
„ *taphius*, 153
„ *triangularis*, 152
„ *unifascia*, 152
„ *vulcanus*, 151
LAPHRIDÆ, 147
LAPHRINA, 147
*Laphyctis*, 138
„ *stigmaticalis*, 138
*Lasiophthicus*, 175
„ *annametes*, 175
*Latreillia*, 181, 182
„ *psamathe*, 181
*Lauxania*, 229
„ *curvinevris*, 229
„ *detereuns*, 229
„ *diadema*, 226
„ *encera*, 229
„ *nigropunctata*, 229
„ *rufiventris*, 229
LAUXANIDÆ, 228
*Laxenecera*, 148
„ *albibarbis*, 148
„ *flavibarbis*, 148
*Lecanipa*, 182
*Lentiphora*, 233
*Leopoldius*, 164
LEPTAPODIDÆ, 211
*Leptogaster*, 135
„ *levis*, 136
„ *macilentus*, 136
„ *marion*, 136
„ *nutilus*, 136
„ *simplex*, 136
„ *tricolor*, 136
„ *varipes*, 136
„ *vitiosus*, 136
LEPTOPODITÆ, 211
„ 211
*Leptopus*, 155
*Leucophora*, 204
*Leucozona*, 175
*Limnophora*, 204
„ *bengalensis*, 204
„ *macei*, 204
*Limosia*, 204, 205
*Linnemyia*, 185
„ *titan*, 185
*Lispe*, 206
„ *assimilis*, 207
„ *dilatata*, 207
„ *glabra*, 206
„ *hyalipennis*, 207
„ *nicobarensis*, 207
„ *orientalis*, 207
„ *sinensis*, 207
„ *tetrastigma*, 207
„ *vittipennis*, 207
*Lithorhychus*, 159
*Lochites*, 135
„ *testaceus*, 135
*Lomacantha*, 186
*Lonchomera leptopoda*, 129
*Lonchopalpus*, 178
*Longina*, 213
LONGINIDI, 211
LOXOCERIDÆ, 210, 229
*Loxonerva*, 218
„ *decora*, 218
*Lucilia*, 196, 197, 198, 200
„ *abdominalis*, 200
„ *bengalensis*, 198
„ *brevigaster*, 198
„ *cæruleifrons*, 198
„ *chalybea*, 199
„ *cærulea*, 199
„ *cyanea*, 199
„ *defixa*, 199
„ *devisa*, 199
„ *dux*, 199
„ *eximia*, 198
„ *flavicalyptrata*, 198
„ *flaviceps*, 197, 199
„ *flavidipennis*, 198
„ *indica*, 198
„ *inducta*, 199
„ *lanta*, 200
„ *leonardi*, 200

Digitized by Google

*Lucilia, leucodes*, 200
„ *ligurriens*, 200
„ *orientalis*, 199
„ *pavonina*, 200
„ *phellia*, 199
„ *philippensis*, 198
„ *pinguis*, 200
„ *polita*, 199
„ *porphyrina*, 198
„ *restinervis*, 200
„ *ruficeps*, 199
„ *ruficornis*, 199
„ *serenissima*, 199
„ *temperata*, 199
„ *trita*, 199
„ *virens*, 200
„ *viridiaurea*, 200
„ *vittata*, 199
*Lycastris*, 167
„ *albipes*, 167
*Lycia*, 209
*Lydella*, 181, 182, 185, 186
„ *lucagus*, 185
*Macharecæ*, 182
*Macrochira*, 231
*Macrosoma*, 203
*Macrotoma*, 213
„ *pelleterii*, 213
*Magnolia*, 54
*Maira*, 149
„ *ænea*, 150
„ *cambodgiensis*, 150
„ *elegans*, 150
„ *hispidella*, 150
„ *nigrithorax*, 150
„ *nycthemera*, 150
„ *paria*, 150
„ *producta*, 150
„ *scapularis*, 150
„ *spectabilis*, 149
„ *tuberculata*, 150
MALACOSOMÆ, 207
*Marshamia*, 183
„ *potans*, 183
*Masicera*, 181, 186
„ *albescens*, 181
„ *cilipes*, 181
„ *elongata*, 181
„ *incivica*, 181
„ *longiseta*, 181
„ *niveiceps*, 181
„ *rubriventris*, 181
„ *tenuisetosa*, 181
„ *vicaria*, 181
*Medina*, 182
MEGACEPHALI, 163
*Megachetum*, 229
*Megaglossa*, 220
*Megapollion*, 186
*Megaspis*, 168
„ *chrysopygus*, 168
*Megaspis, crassus*, 168
„ *errans*, 168
„ *zonalis*, 168
*Megistogaster*, 188
„ *costatus*, 188
„ *fuscipennis*, 188
„ *imbrasus*, 188
*Meigenia*, 181
„ *ciliata*, 181
„ *latestriata*, 181
*Meiogyne, virgata*, 29
*Melanomya*, 188
*Melanophora*, 188
*Melanostoma*, 175, 177
„ *orientalis*, 177
„ *univittata*, 177
*Melina*, 208
*Melinda*, 196, 197, 198
„ *metilia*, 196
*Melithreptus*, 177
MELITOBIÆ, 234
*Melius erytropygatum*, 136
*Melodorum*, 3, 41, 64, 70, 101, 107, 111, 112, 113
„ *bancanum*, 105
„ *cylindricum*, 102, 106
„ *elegans*, 103, 111, 112
„ *fulgens*, 101, 102, 104, 111, 112
„ *glaucum*, 63
„ *hypoglaucum*, 102, 106, 107
„ *Kentii*, 112
„ *lanuginosum*, 103, 108
„ *latifolium*, 103, 105, 106, 108
„ „ *var. ovoidea*, 106
„ „ „ *typica*, 106
„ *litseaefolium*, 101, 103
„ *macranthum*, 102, 104
„ *Maingayi*, 103, 109
„ *manubriatum*, 102, 104
„ *mollissimum*, 105
„ *monospermum*, 85
„ *parviflorum*, 102, 107, 108
„ *pisocarpum*, 103, 112
„ *prismaticum*, 103, 109, 111
„ *pyramidale*, 112
„ *rubiginosum*, 103
„ *sphaerocarpum*, 102, 107, 108
*Meriania*, 181
*Mericia*, 181
*Merodon*, 171
„ *albifasciatus*, 171
„ *varicolor*, 171
*Mesogramma*, 177
*Mesograpta*, 177
*Mesorhaga*, 158
„ *torquata*, 158
*Metallea*, 201
*Metopia*, 182
*Metopina*, 234
*Mexoneuron*, 130

Digitized by Google

*Mezoneuron, andamanicum, 130, 131
„ cucullatum, 130
„ enneaphyllum, 130
„ glabrum, 130
„ pubescens, 130
„ sumatranum, 130
Mezzettia, 4, 128
* „ Curtisii, 129
„ Herveyana, 129, 130
„ leptopoda, 129
Michogaster, 215
„ bambusarium, 215
Michotamia, 148
„ analis, 148
„ annulata, 148
Micramptoma, 173
Microcera, 163
Microdon, 166, 173
„ apicalis, 166
„ stilboides, 166
„ sumatranus, 166
Micropeza, 213, 214
„ fragilis, 213
Microstylium, 136
„ amoyense, 136
„ apicalis, 136
„ basirufum, 136
„ bicolor, 136
„ brevipennatum, 136
„ brunnipenne, 136
„ erytropygum, 136
„ eximium, 137
„ flaviventre, 136
„ hæmorrhoidale, 137
„ incomptus, 137
„ indutum, 137
„ nigricauda, 134
„ nigrum, 137
„ nitidiventris, 137
„ sinense, 136
„ spinitarsis, 136
„ vestitum, 137
„ vica, 137
Midas, 133
„ ruficornis, 133
Midasidæ, 133
Milesia, 165, 166, 168, 171, 172, 173
„ gigas, 165
„ limbipensis, 165
„ maculatis, 165
„ meyeri, 165
„ reinwardtii, 165
„ vespoides, 165
Miliusa, 4, 123
„ campanulata, 124
* „ longipes, 123, 124
„ macrocarpa, 124
„ macropoda, 124
„ mollis, 124
„ Roxburghiana, 123, 124
„ tristis, 124
Miliusa, Wallichiana, 123
Miliusiæ, 3, 90
Mimegralla, 213
„ birmanensis, 213
Minettia, 210
„ signata, 210
Mitrephora, 3, 23, 79, 86, 87, 89, 90
„ excelsa, 23
„ macrophylla, 86, 87
„ Maingayi, 86
„ „ var. Kurzii, 86, 87
* „ Prainii, 86, 88
„ reticulata, 86, 87, 88
„ setosa, 81
„ Teysmanii, 86
„ Thorellii, 87
„ vaudæflora, 87
Mitrephoreæ, 3, 90
Mochterus, 147
„ patruelis, 147
Monoon, 50
„ canangioides, 57
„ lateriflorum, 59
„ sumatranum, 53
Morellia, 190, 196
„ affixa, 190, 196
Morinia, 188
„ chloë, 188
Mosillus, 228
Mufetia, 197
Mulio, 166, 175, 210
„ serratus, 175
Musca, 155, 175, 188, 192, 193, 196, 197, 198, 200, 201, 203, 204, 205, 206, 207, 217
„ abdominalis, 200
„ adumbrata, 202
„ affixa, 190
„ albina, 202
„ aucta, 202
„ chalybea, 199
„ cinerea, 183
„ cingalesina, 203
„ cluvia, 202
„ cærulea, 199
„ confixa, 201
„ convexifrons, 202
„ corvina, 202
„ crux, 224
„ defixa, 199
„ determinata, 202
„ diffidens, 201
„ dioclea, 195
„ divisa, 199
„ domestica, 202
„ dotata, 195
„ dux, 199
„ eutæniata, 203
„ exempta, 201
„ ferrugineus, 217
„ fuscipennis, 188

Digitized by Google

*Musca, hortensia*, 202
„ *hortulana*, 202
„ *humilis*, 202
„ *inducta*, 199, 202
„ *infixa*, 188
„ *jejuna*, 195
„ *lauta*, 200
„ *ligurriens*, 200
„ *mediana*, 202
„ *metilia*, 196
„ *micans*, 188
„ *munda*, 201
„ *nebulo*, 202
„ *niveisynamma*, 202
„ *perfixa*, 201
„ *phellia*, 199
„ *pinguis*, 200
„ *planiceps*, 202
„ *polita*, 199
„ *porphyrina*, 198
„ *refixa*, 201
„ *remuria*, 197
„ *rufifrons*, 202
„ *scapularis*, 203
„ *serenissima*, 199
„ *temperata*, 199
„ *tifata*, 197
„ *trita*, 199
„ *varia*, 180
„ *varicolor*, 201
„ *ventrosa*, 202
„ *virens*, 200
„ *viridiaurea*, 200
„ *xanthomelas*, 202
MUSCARIÆ, 192
MUSCEÆ, 192
*Muscina*, 192, 193, 196, 205
„ *quadrinotata*, 193
*Mya*, 197
*Myantha*, 207
*Mycetia*, 231
*Mycophaga*, 205
*Mydæ*, 205
*Mydas*, 133
MYDASIDÆ, 133
MYDASII, 133
MYDASINA, 133
*Mydina*, 203, 205
*Myennis*, 220
*Myobia*, 185
„ *nigripes*, 185
„ *robusta*, 185
*Myocera*, 187
*Myochrysa*, 187
*Myodina*, 220
MYODINÆ, 216
*Myoleja*, 227
*Myopa*, 178
„ *cincta*, 178
*Myopella*, 178
*Myophora*, 190
*Myophora, duvaucelii*, 190
„ *fulvicornis*, 190
*Myophthiria*, 235
„ *reduvioides*, 235
MYOPICTE, 178
*Myopina*, 178
*Myristica Finlaysoniana*, 104
*Myrmecomya*, 214
*Necera*, 186
*Nectarinus*, 175
*Nectarius*, 175
*Nematoproctus*, 158
*Nemoræa*, 181
„ *bicolor*, 182
*Nemorilla*, 182
*Nemotelus*, 133, 154, 158, 160
*Nerea*, 231
*Neria*, 211
NERIADES, 211
*Nerina*, 204
*Nerius*, 211, 214
„ *duplicatus*, 211
„ *fuscipennis*, 211
„ *fuscus*, 211
„ *indica*, 211
„ *inermis*, 211
„ *lineolatus*, 211
*Nirmomyia*, 235
*Nitellia*, 201
*Nœeta*, 223
„ *latiuscula*, 223
*Nothybus*, 211
„ *longithoraæ*, 211
*Notiphila*, 230, 232
„ *albiventris*, 230
„ *chinensis*, 230
„ *ciliata*, 230
„ *dorsopunctata*, 230
„ *fasiata*, 230
„ *immaculata*, 230
„ *indica*, 230
„ *peregrina*, 230
„ *radiatula*, 230
„ *sinensis*, 230
*Nusa*, 118
„ *æqualis*, 148
„ *formio*, 148
*Nycteribia*, 236
„ *ferrarii*, 236
„ *hopei*, 236
„ *jenynsii*, 236
„ *minuta*, 236
„ *roylii*, 236
„ *sykesii*, 236
NYCTERIBIÆ, 234, 236
NYCTERIBIDÆ, 234, 236
*Oblicia*, 210
*Ochromyia*, 195, 198
„ *bicolor*, 195
„ *fasciata*, 195
„ *fulvescens*, 195

Digitized by Google

*Ochromyia, javana*, 195
„ *jejuna*, 195
„ *quadrinotata*, 195
*Ochropleurum*, 186
„ *javanum*, 186
*Ochthera*, 231
„ *rotundata*, 231
*Ocyphro*, 179
*Ocyptera*, 191
„ *bicolor*, 191
„ *fuscipennis*, 191
„ *umbripennis*, 191
OCYPTERATÆ, 176, 191
OCYPTERIDÆ, 191
ŒSTRACIDES, 177
ŒSTRIDÆ, 177, 178
*Œstrus*, 178
*Olfersia*, 235
„ *longipalpis*, 235
„ *spinifera*, 236
*Olina*, 232
*Ommatius*, 139
„ *androcles*, 140
„ *argyrochirus*, 140
„ *aurata*, 139
„ *chinensis*, 140
„ *compeditus*, 139
„ *conopsoides*, 139, 140
„ *coryphe*, 140
„ *despectus*, 140
„ *dispar*, 140
„ *frauenfeldi*, 140
„ *fulvidus*, 140
„ *gracilis*, 140
„ *hecale*, 140
„ *impeditus*, 140
„ *inextricatus*, 140
„ *insularis*, 141
„ *leucopogon*, 139
„ *minor*, 140
„ *nanus*, 140
„ *noctifer*, 140
„ *pennus*, 140
„ *pictipennis*, 140
„ *pinguis*, 141
„ *platymelas*, 139
„ *rubicundus*, 141
„ *rufipes*, 140
„ *signinipes*, 140
„ *spathulata*, 139
„ *spinibarbis*, 140
„ *suffusus*, 141
„ *taeniomerus*,
*Onodont*, 203
*Oodigaster*, 183
*Ophira*, 203
„ *congressa*, 203
„ *nigra*, 204
„ *riparia*, 204
*Oplogaster*, 205
*Opomyza*, 232
OPOMYZIDÆ, 210, 211
*Orectocera*, 185
„ *micans*, 185
*Orellia*, 185
*Ormia*, 195
*Ornidia*, 174
*Ornithomyia*, 235
„ *columbæ*, 235
„ *javana*, 235
„ *nigricans*, 235
*Ornitophila*, 235
*Orophea*, 3, 79, 87, 88, 89, 90
„ *acuminata*, 82
„ *anceps*, 86
* „ *cuneiformis*, 83, 84
„ *dodecandra*, 80, 84
„ *enterocarpa*, 79, 82
* „ *gracilis*, 79, 83
* „ *hastata*, 80, 83
„ *hexandra*, 79, 81
„ *hirsuta*, 79, 81
„ *Katschallica*, 79, 80
„ *maculata*, 79, 82, 85
„ *polycarpa*, 80, 85
„ *reticulata*, 87
„ *setosa*, 79, 80
„ *Thorelii*, 82
„ *undulata*, 86
„ *uniflora*, 83
ORTALIDA, 216
ORTALIDÆ, 214, 223
*Ortalis*, 214, 220, 221
„ *isara*, 220
„ *rutilans*, 220
OSCINIDES, 232
OSCININA, 232
*Oscinis*, 211, 217, 220, 232, 233
„ *ensifera*, 233
„ *insignis*, 233
*Osmœa*, 186
*Otites*, 220
*Oxycephala*, 218
„ *pictipennis*, 218
*Oxigraphide*, 272
*Oxymitra*, 3, 97, 100
„ *affinis*, 98
„ *bassiœfolia*, 110
„ *biglandulosa*, 98, 100
„ *calycina*, 98, 99
„ *cuneiformis*, 99, 100
„ *filipes*, 97, 98, 99
„ *glauca*, 97, 98, 101
OXYMITREÆ, 90
*Oxyna*, 226,
*Oxyphora*, 223
„ *malaica*, 223
*Pademma*, 237, 238, 239, 243, 241
„ *apicalis*, 242
„ *augusta*, 242
„ *burmeisteri*, 242



Digitized by Google

*Pademma, crassa*, 241
„ *dharma*, 242
„ *erichsonii*, 241
„ *grantii*, 241
„ *illustris*, 241
„ *imperialis*, 242
„ *indigofera*, 242
„ *klugii*, 240, 241
„ *kollari*, 241
„ *macclellandi*, 242
„ *masoni*, 241
„ *pembertoni*, 242
„ *regalis* 242
„ *sherwillii*, 242
„ *sinhala*, 240
„ *uniformis*, 242
*Pales*, 182
*Palloptera*, 209
PALOMIDÆ, 208, 210, 229
*Palpomyia*, 220
*Palpostoma*, 195
*Palusia*, 205, 206
*Ponzeria* 181,
*Paracelyphus*, 228,
„ *hyacinthus*, 228
*Paragus*, 175
„ *crenulatus*, 175
„ *politus*, 175
„ *serratus*, 175
PARALIMNA, 230
„ *sinensis*, 230
*Paralophosia imbuta*, 186
*Parartabotrys sumatrana*, 115
*Peckia*, 189
*Pegomyia*, 204
*Peleteria*, 179, 180
„ *javanica*, 179
*Pelops doryca*, 159
*Peodes*, 158
„ *nicobarensis*, 158
*Pericheta*, 182
*Petalophora*, 222
*Phœanthus*, 4, 121
„ *andamanicus*, 121, 122
„ *dioicus*, 124
„ *lucidus*, 121, 122
„ *nutans*, 121, 122
*Phania*, 191
„ *indica*, 191
*Phantasma*, 213
*Phaonia*, 203
*Phasia*, 179
„ *indica*, 179
PHASIADÆ, 179
*Pherbellia*, 208
*Pherbina*, 211
*Philinta*, 207
PHILLODROMYNA, 154
*Philodendria*, 232
*Philodicus*, 142, 143
„ *agnitus*, 142
*Philodicus, ceylanicus*, 143
„ *chinensis*, 143
„ *confinis*, 143
„ *externo-testacea*, 143
„ *fuscus*, 142
„ *innotabilis*, 142
„ *javanus*, 142
„ *rubritarsatus*, 143
„ *rufibarbis*, 143
„ *rufo-ungulatus* 143
„ *westermanni*, 143
*Philonicus*, 143
„ *nigrosetosus*, 143
*Phora*, 232, 234
„ *cleghorni*, 234
„ *orientalis*, 234
„ *sinensis*, 234
*Phorbia*, 204
*Phorella*, 189
PHORIDÆ, 234
*Phormia*, 195, 197
„ *dotata*, 195
*Phorocera*, 182
„ *hyalipennis*, 182
„ *javana*, 182
„ *zebina*, 182
*Phorosia*, 178
*Phrissopodia*, 189
„ *metallica*, 189
*Phryno*, 185, 186
*Phryxe*, 181, 186
*Phthiria*, 163
„ *gracilis*, 163
PHTHIRIDIUM, 234, 236
PHTHIROMYIÆ, 234
*Phumosia*, 195
„ *fulvicornis*, 195
*Phyllis*, 204
*Physocephala*, 164
*Phytomyia*, 168
„ *chrysopygus*, 168
PHYTOMYZIDES, 234
*Pictina*, 178
PIOPHILIDÆ, 230, 231
*Pipiza*, 175
PIPUNCULIDÆ, 163
*Pipunculus*, 163
„ *abscissus*, 163
„ *armatus*, 163
*Platycheirus*, 175
*Platychira*, 182
*Platystoma*, 218, 220, 226
„ *albitarsis*, 220
„ *albovittatus*, 220
„ *cinctus*, 227
„ *decora*, 218
„ *irrorata*, 220
„ *orientalis*, 220
„ *punctiplena*, 220
„ *rigida*, 220
„ *superba*, 220

Digitized by Google

*Platystoma, xanthomera*, 220
*Plaxemya*, 201
*Plinthomyia*, 198
„ *emimelania*, 198
*Pogonosoma*, 149
„ *beccarii*, 149
„ *stigmatica*, 149
*Poilopus*, 155
*Pollenia*, 201
„ *munda*, 201
„ *reflectens*, 201
*Polyalthia*, 3, 28, 40, 41, 49, 58, 64, 97 100, 129
„ *aberrans*, 51, 63, 64
„ *andamanica*, 50, 53, 56, 57
„ *argentea*, 97
* „ *Beccarii*, 52, 65
„ *biglandulosa*, 100
* „ *bullata*, 51, 64
„ *cinnamomea*, 52, 66
* „ *clavigera*, 51, 60
* „ *congregata*, 51, 55, 61
„ *cuneiformis*, 99, 100
„ *dubia*, 96
* „ *dumosa*, 50, 52
„ *elliptica*, 65
„ *fruticans*, 21
* „ *glomerata*, 51, 61
* „ *Hookeriana*, 50, 57
* „ *hypogœa*, 51, 62
„ *hypoleuca*, 50, 52, 53
„ *Jenkinsii*, 50, 54, 56, 57
„ *Korinti*, 51
* „ *Kunstleri*, 50, 55
„ *lateriflora*, 51, 58
* „ *macrantha*, 50, 54, 6
„ *macrophylla*, 76, 96
* „ *macropoda*, 51, 60 61
„ *magnoliæflora*, 50, 54
„ *obliqua*, 51, 63
* „ *oblonga*, 51, 65, 78
* „ *pachyphylla*, 52, 66
„ *pulchra*, 50, 55
„ „ *var. angustifolia*, 55
„ *pycnantha*, 52, 67
„ *sclerophylla*, 51, 59
* „ *Scortechinii*, 50, 56
„ *simiarum*, 50, 58, 59
„ „ *var. parvifolia*, 58
„ *subcordata*, 51, 64
„ *suberosa*, 52
„ *sumatrana*, 50, 53
„ *Teysmannii*, 66
*Polycheta*, 182
*Polyctenes*, 235
„ *lyræ*, 235
„ *spasmæ*, 235
*Polystodes*, 215
*Popowia*, 3, 21, 28, 88, 89, 90, 97
„ *affinis*, 92
„ *Beddomiana*, 93
*Popowia, fœtida*, 91, 93
* „ *fusca*, 91, 94, 95
„ *Helferi*, 91, 93
„ *Hookeri*, 91, 97
„ *Kurzii*, 89, 91, 96, 97
„ *nervifolia*, 27, 28, 91, 95
* „ *nitida*, 21, 91, 92, 97
„ *parvifolia*, 97
„ *pauciflora*, 91, 92
* „ *perakensis*, 91, 94
„ *pisocarpa*, 90
„ *ramosissima*, 90, 91, 92, 94
„ *rufula*, 92
„ *tomentosa*, 91, 95
* „ *velutina*, 91, 94
*Porphyrops*, 157, 158
*Priomerus*, 168
„ *fasciatus*, 168
*Proctachantus*, 143
*Promachus*, 141, 143
„ *albopilosus*, 141
„ *amorges*, 141
„ *anicius*, 141
„ *bifasciatus*, 142
„ *felinus*, 142
„ *gobares*, 141
„ *heteropterus*, 141
„ *inornatus*, 142
„ *leucopareus*, 142
„ *maculatus*, 142
„ *marcii*, 141
„ *melampygus*, 142
„ *nicobarensis*, 141
„ *orientalis*, 141
„ *pallipennis*, 141
„ *rufimistacea*, 141
„ *testaceipes*, 141
„ *viridiventris*, 141
„ *vittula*, 142
*Prosyrogaster*, 219
„ *chelyonothus*, 219
*Pseuduvaria reticulata*, 87
*Psila*, 210
„ *apicalis*, 210
„ *cruciata*, 222
PSILIDES, 229
PSILINÆ, 210, 229
*Psilocephala*, 154
„ *indica*, 154
*Psilomyda*, 210
PSILOMYDÆ, 210, 229
*Psilomyia*, 210
*Psilopa*, 231
*Psilopodius*, 155
„ *æneus*, 155
„ *allectans*, 157
„ *alliciens*, 157
„ *apicalis*, 156
„ *appendiculatus*, 156
„ *armillatus*, 156
„ *bislectum*, 156

Digitized by Google

*Psilopodius, cælestis*, 156
„ *clarus*, 156
„ *collucens*, 157
„ *conicornis*, 156
„ *crinicornis*, 156
„ *cupido*, 156
„ *delectans*, 157
„ *derelictus*, 157
„ *elegans*, 156
*filatus*, 157
„ *flavicornis*, 156
„ *fuscopennatus*, 156
„ *illiciens*, 157
„ *leucopogon*, 156
„ *nitens*, 156
„ *obscuratus*, 157
„ *patellatus*, 157
„ *posticus*, 156
„ *prolectans*, 157
„ *proliciens*, 157
„ *pusillus*, 156
„ *robustus*, 156
„ *setipes*, 156
„ *subnotatus*, 156
„ *tenebrosus*, 157
„ *villipes*, 157
„ *vittatus*, 156
*Psilopus*, 155
„ *globifer*, 155
*Pterogenia*, 219
„ *dayak*, 219
„ *flavipennis*, 219
*Pterospylus*, 155
„ *bicolor*, 155
*Ptilona*, 227
„ *brevicornis*, 227
„ *dunlopi*, 227
„ *notabilis*, 227
„ *sexmaculata*, 227
PUPIPARA, 234
*Purpurellia*, 178
PUTRELLIDÆ, 234
*Pyramidanthe*, 108
„ *macrantha*, 111
„ *rufa*, 110, 111
*Pyrellia*, 200
„ *confixa*, 201
„ *diffidens*, 201
„ *exempta*, 207
„ *perfixa*, 201
„ *refixa*, 201
„ *sivah*, 201
„ *stella*, 201
„ *violacea*, 200
*Pyrophœna*, 175
*Ramburia*, 186
RANUNCULACEÆ, 270, 271, 273, 316
*Ranunculus Shaftoanus*, 272
RAPHINA, 155
*Raphis*, 189
„ *elongata*, 189
*Raymondia*, 236
„ *huberi*, 236
„ *kollari*, 236
*Reaumuria*, 179
*Rhadinomyia*, 221
„ *orientalis*, 221
*Rhaphium*, 157
„ *dilatatum*, 157
*Rhedia*, 179
„ *atra*, 179
*Rhengiæ*, 172
*Rhinia*, 193
„ *fulvipes*, 193
„ *testacea*, 193
*Rhopalocarpus*, 69
„ *fruticosus*, 68
*Rhynchomya*, 192
„ *aberrans*, 192
„ *bicolor*, 192
„ *indica*, 192
„ *obsoleta*, 192
„ *palliceps*, 192
„ *plumata*, 192
*Rhynomya*, 182
RHYSOMYZÆ, 179, 191
*Rioxa*, 222
„ *confinis*, 222
„ *erebus*, 222
„ *lanceolata*, 222
„ *nox*, 222
*Rivellia*, 221
„ *persicæ*, 221
*Roesellia*, 185
*Rohrella*, 203, 205
*Rutilia*, 187
„ *angusticarinata*, 187
„ *flavipennis*, 187
„ *nitens*, 287
*Sageraea*, 2, 6, 7
„ *elliptica*, 7
„ *Hookeri*, 7
*Salpinx crassa*, 241
„ *erichsonii*, 241
„ *grantii*, 241
„ *illustris*, 241
„ *klugii*, 241
„ *masoni*, 241
*Sapromyza*, 209, 210
„ *bengalensis*, 209
„ *biguttata*, 209
„ *conferta*, 209
„ *fallenii*, 209
„ *javana*, 210
„ *levis*, 209
„ *pœsila*, 210
„ *scutellaris*, 210
SAPROMYZIDÆ, 229
*Sarcophaga*, 189, 190, 196
„ *aliena*, 190
„ *emigrata*, 190
„ *indicata*, 190

Digitized by Google

*Sarcophaga, javana*, 189
„ *lineatocollis*, 189
„ *princeps*, 189
„ *reciproca*, 190
„ *ruficornis*, 189
„ *rufipalpis*, 190
„ *sericea*, 190
„ *taenionota*, 189
„ *tenuipalpis*, 189
SARCOPHAGEÆ, 188
SARCOPHAGINÆ, 188
*Sarcophila*, 190
„ *alba*, 190
*Sargus*, 229
*Saropogon*, 135
„ *scalare*, 135
*Satyra*, 158
*Scaptomyza*, 231
SCATOMYZIDÆ, 207, 208, 210, 234
SCATOMYZIDES, 207, 208, 229
*Scatophaga*, 208, 210, 220, 224, 226, 227
SCATOPHAGIDÆ, 207
SCATOPHAGINA, 207, 208
*Schœnomyza*, 205
*Scholastes*, 219, 226
„ *cinctus*, 227
*Sciapus*, 155
*Sciomyza*, 208
„ *orientalis*, 208
„ *propinqua*, 209
„ *repleta*, 208
„ *reticulata*, 209
„ *terminalis*, 209
SCIOMYZIDÆ, 210
SCIOMYZINA, 208, 210
*Scœva*, 175
„ *scutellaris*, 176
*Scylaticus*, 138
„ *degener*, 139
„ *vertebratus*, 138
SCYOMYZIDES, 229
*Senogaster*, 172
„ *lutescens*, 172
*Senometopia*, 186
*Senopterina*, 218
„ *ænea*, 218
„ *batavensis*, 218
„ *flavipes*, 218
„ *labialis*, 218
„ *marginata*, 218
„ *zonalis*, 218
*Sepedon*, 210
„ *æneseens*, 211
„ *crishna*, 211
„ *ferruginosus*, 210
„ *javanensis*, 210
„ *plombellus*, 211
SEPSIDÆ, 211, 214
*Sepsis*, 214
„ *bicolor*, 215
„ *complicata*, 214
*Sepsis, indica*, 214
„ *lateralis*, 214
„ *monostigma*, 215
„ *nitens*, 214
„ *trivittata*, 214
„ *viduata*, 215
*Servillia*, 180
*Sicus*, 178
*Silbomyia*, 188
„ *fumipennis*, 188
„ *fuscipennis*, 188
„ *infixa*, 188
„ *micans*, 188
*Simosyrphus*, 161, 175
„ *planifacies*, 167
*Sisyropa*, 182
„ *thermophila*, 182
*Sitarea*, 224
*Solieria*, 185
*Somomya*, 197, 198
„ *atrifacies*, 198
„ *birmanensis*, 197
„ *cæruleocincta*, 197
„ *cærulcolimbata*, 198
„ *cyaneocincta*, 198
„ *dives*, 198
„ *fuscocincta*, 197
„ *infumata*, 197
„ *melanorhina*, 198
„ *nebulosa*, 198
„ *nitidifacies*, 198
„ *obesa*, 197
„ *pachysoma*, 198
„ *pagodina*, 197
„ *pictifacies*, 197
„ *rubiginosa*, 197
„ *versicolor*, 197
„ *xanthomera*, 198
*Sophia*, 187
*Sophira*, 222
„ *concinna*, 223
„ *venusta*, 223
*Spallanzania*, 179
*Spariglossum*, 164
*Spathipsilopus*, 155
„ *globifer*, 155
*Spatigaster*, 175
*Spazigaster*, 175
*Sphærocera*, 231
SPHÆROCERIDÆ, 234
*Sphegina*, 168
„ *macropoda*, 168
*Sphenella*, 226, 227
„ *indica*, 227
„ *sinensis*, 227
*Sphixea*, 165
„ *flavifacies*, 165
„ *fulvipes*, 165
„ *fuscicosta*, 165
*Sphiximorpha*, 165
*Sphixosoma*, 164

Digitized by Google

*Sphixosoma, anchorata*, 165
*Sphærophoria*, 177
„ *bengalensis*, 177
„ *indiana*, 177
*Sphryracephala*, 216
„ *hearseiana*, 216
*Spilogaster*, 203, 205
„ *albiceps*, 205
„ *leucocerus*, 205
„ *pruinosus*, 205
*Stelechocarpus*, 2, 4, 5
„ *Burahol*, 4, 5, 6
* „ *nitidus*, 4, 5
* „ *punctatus*, 4
STENOPETALON, 43
*Stichopogon*, 138
„ *albicapillus*, 138
„ *nicobarensis*, 138
*Stictoplœa*, 237
„ *harrisii*, 245
*Stomorhina*, 193
„ *bivittata*, 193
„ *quadrinotata*, 193
*Stomoxis*, 192
„ *calcitrans*, 192
„ *flavipennis*, 192
„ *libatrix*, 192
„ *plurinotatus*, 192
*Stratiomys*, 166
STREBLIDÆ, 234, 236
STREBLIDI, 234, 236
*Strumeta*, 223
„ *conformis*, 223
*Stylophora*, 225
„ *zonata*, 225
*Suillia*, 208, 209
*Sylvia*, 209
*Synamphoneura*, 201
„ *cuprina*, 201
*Synolcus*, 147
„ *xanthopus*, 147
*Syperosia*, 192
*Syritta*, 173
„ *orientalis*, 173
„ *rufifacies*, 173
SYRPHIÆ, 164
SYRPHIDÆ, 164
SYRPHINÆ, 164
*Syrphus*, 165, 166, 167, 168, 189, 171, 172, 173, 174, 175, 177, 191, 210
„ *alternans*, 175
„ *arvorum*, 169
„ *assimilis*, 176
„ *balteatus*, 175
„ *confrater*, 176
„ *consequens*, 177
„ *consimilis*, 176
„ *corollæ*, 176
„ *coromandelensis*, 176
„ *cothonea*, 176
„ *cranapes*, 176
*Syrphus, crassus*, 168
„ *cyathifer*, 177
„ *divertens*, 177
„ *duplex*, 177
„ *ericetorum*, 167
„ *erythropygus*, 175
„ *fascipennis*, 175
„ *heterogaster*, 177
„ *incisuralis*, 167
„ *infirmus*, 175
„ *javanus*, 176
„ *lunatus*, 176
„ *macropterus*, 177
„ *megacephalus*, 168
„ *mundus*, 176
„ *nectarinus*, 175
„ *neglectus*, 176
„ *ægrotus*, 175
„ *opimius*, 176
„ *orientalis*, 177
„ *orsua*, 176
„ *pedius*, 176
„ *planifacies*, 167
„ *pleuralis*, 177
„ *quadrilineatus*, 169
„ *quinquestriatus*, 169
„ *rufofasciatus*, 176
„ *salviæ*, 167
„ *scutellaris*, 176
„ *serarises*, 176
„ *splendens*, 177
„ *striatus*, 176
„ *triligatus*, 175
„ *trilimbatus*, 175
„ *univittata*, 177
„ *virdaureus*, 176
„ *zonalis*, 168
„ *zonatus*, 168
*Sytropus*, 163
„ *eumenoides*, 163
„ *ophioneus*, 163
„ *polistoides*, 163
„ *tipuloides*, 163
*Tachina*, 179, 180, 181, 182, 183, 185, 186, 192
„ *adusta*, 184
„ *alacris*, 186
„ *alta*, 184
„ *atriventris*, 184
„ *beelzebub*, 186
„ *bomboides*, 184
„ *cilipes* 181
„ *cinerea*, 183
„ *convergens*, 183
„ *dorsalis*, 184
„ *errans*, 183
„ *fasciata*, 184
„ *flavipennis*, 183
„ *fulva*, 184
„ *grandis*, 184
„ *imbrasus*, 188

Digitized by Google

*Tachina, imbuta*, 186
„ *indica*, 182
„ *innocens*, 184
„ *javana*, 180, 184
„ *lithanthrax* 180
„ *macularis*, 183
„ *mellea*, 183
„ *metallica*, 183
„ *molitor*, 184
„ *munda*, 183
„ *nigricornis*, 183
„ *nigriventris*, 183
„ *nitida*, 184
„ *ophirica*, 185
„ *orbata*, 184
„ *orientalis*, 184
„ *potans*, 183
„ *psamathe*, 181
„ *rufifrons*, 183
„ *salva*, 184
„ *sobria*, 184
„ *subcinerea*, 184
„ *sugens*, 183
„ *thermophila*, 182
„ *tricincta*, 184
„ *umbrosa*, 184
„ *viridiaurea*, 183
TACHINARIÆ, 179
TACHINARIDÆ, 179
TACHINIDÆ, 179
*Tachydromyia*. 155
TACHYDROMYNÆ, 154
*Tæniaptera*, 213
„ *albimana*, 213
„ *amæna*, 213
„ *cinereipennis*, 213
*Tairmairia*, 173
*Tanipoda*, 212
„ *caligata*, 212
„ *cubitalis*, 213
„ *luteilabris*, 213
„ *strenua*, 212
TANYPEZINA, 211
TANYPEZINÆ, 211, 214
*Teleopsis*, 216
„ *breviscopium*, 216
„ *fulviventris*, 216
„ *longiscopium*, 216
„ *sykesii*, 216
*Temnocera*, 174
„ *violacea*, 174
*Tephitis fessata*, 224
TEPHRITIDÆ, 216, 223
*Tephritis*, 200, 214, 217, 220, 221, 224, 226, 227. 228, 232
„ *asteria*, 226
„ *brahma*, 226
„ *fasciventris*, 226
„ *paritii*, 226
„ *violacea*, 200
TEPHRITOIDI, 216
*Tepritis*, 232
*Terellia*, 224
*Tetanocera*, 211
„ *discalis*, 211
TETANOCERIDÆ, 210
TETANOCERINÆ, 210
*Texara*, 214
„ *compressa*, 214
*Thalictrum punduanum*, 271
„ „ *var rufum*, 271
*Thelaira*, 187
THELIDOMYDÆ, 211, 214
*Themara*, 221
„ *ampla*, 221
„ *hirtipes*, 221
„ *maculipennis*, 221
„ *ypsilon*, 221
THERAMYDÆ, 188
*Thereva*, 154, 173, 179
„ *albina*, 154
„ *bigoti*, 154
„ *cylindrica*, 154
„ *indica*, 154
„ *lateralis*, 154
„ *nigella*, 154
„ *nivaria*, 154
„ *persequa*, 154
, *præcedens*, 154
„ *sequa*, 154
„ *sequens*, 154
THEREVIDÆ, 153
*Therobia*, 178
„ *abdominalis*, 178
*Thryptocera*, 186
„ *setinervis*, 186
*Tigridemyia*, 167
*Tigridiamyia*, 167
*Tigridomyia*, 167
„ *pictipes*, 167
*Timia*, 228
*Tolmerus*, 147
„ *agilis*, 147
„ *nicobarencis*, 147
*Tozonevra*, 209
*Tozophora*, 163
„ *javana*, 163
„ *silpa*, 163
*Trennia*, 203
*Trinaria*, 159
*Trineura*, 232, 234
„ *peregrina*, 232
TRINEURÆ, 231
TRINEURIDES, 234
*Trivalvaria*, 97
*Trixomorpha*, 182
„ *indica*, 180, 182
*Trollius*, 271
„ *laxus*, 272
„ *palustris*, 271
„ 172
„ *sinensis*, 172

Digitized by Google

*Trupanea*, 141, 142, 143, 220, 224, 226
„ *agnita*, 144
„ *albopilosa*, 143
„ *albopilosus*, 141
„ *amorges*, 141
„ *apicalis*, 143
„ *apivora*, 144
„ *bifasciata*, 143
„ *bifasciatus*, 142
„ *calanus*, 144
„ *confinis*, 143
„ *contracta*, 144
„ *duvaucelii*, 143
„ *externo-testacea*, 143
„ *flavibarbis*, 143
„ *fuscus*, 142
„ *heteropterus*, 141
„ *innotabilis*, 142
„ *inserens*, 144
„ *javana*, 142
„ *leucopyga*, 144
„ *maculatus*, 142
„ *maculipes*, 144
„ *marcii*, 141
„ *orientalis*, 141
„ *pallipennis*, 141
„ *rubritarsata*, 142
„ *rubritarsatus*, 143
„ *rufimistacca*, 141
„ *rufo-ungulatus*, 143
„ *sagittifera*, 144
„ *telifera*, 144
„ *testaceipes*, 141
„ *univentris*, 144
„ *varipes*, 143
„ *viridiventris*, 141
„ *westermanni*, 143
*Trypeta*, 222, 224, 225, 226, 227
„ *acrostacta*, 224
„ *antiqua*, 225
„ *atilia*, 224
„ *basilaris*, 224
„ *capitata*, 223
„ *contraria*, 225
„ *crux*, 224
„ *cylindrica*, 225
„ *ferruginea*, 225
„ *fessata*, 224
„ *incissa*, 224, 225
„ *melaleuca*, 224
„ *mixta*, 225
„ *modesta*, 224
„ *mutica*, 225
„ *obsoleta*, 224
„ *quadrinicisa*, 227
„ *reinhardti*, 224
„ *rudis*, 224
„ *sinensis*, 225
„ *sinica*, 224
„ *stella*, 225
„ *tubifera*, 224
*Trypeta, tucia*, 224
„ *vaga*, 224
„ *violacea*, 224
TRYPETIDA, 223
TRYPETIDÆ, 216
TRYPETINÆ, 216, 223
*Trypoderma*, 178
„ *abdominalis*, 178
*Tubicalyx*, 130
*Ulidia*, 228
„ *ænea*, 228
„ *clausa*, 228
„ *divergens*, 228
„ *fulviceps*, 228
„ *melanophila*, 228
ULIDIÆ, 227
ULIDINA, 228
*Unona*, 3, 40, 42, 49, 111
„ *amherstiana*, 45
„ *biglandulosa*, 46
„ *cauliflora*, 66
„ *chinensis*, 45
„ *cochin-chinensis*, 44
„ *cordifolia*, 45
„ *crinita*, 43, 48
„ *Dasymaschala*, 43, 47
„ „ *var. Blumei*, 47
„ „ „ *Wallichi*, 47
„ *desmantha*, 43, 48
„ *Desmos*, 43, 44
„ *discolor*, 43, 44, 45, 47
„ „ *var. bracteata*, 45
„ „ „ *lævigata*, 45
„ „ „ *latifolia*, 45
„ „ „ *pubescens*, 45
„ „ „ *pubiflora*, 45
„ *dumosa*, 43, 45
„ *Dunalii*, 43, 45
„ *fulva*, 44
„ *grandiflora*, 17
„ *latifolia*, 105
„ *leptopetala*, 42
„ *Lessertiana*, 45
„ *longiflora*, 43, 46, 47
„ *macrantha*, 111
„ *macrophylla*, 76
„ *mesnyi*, 64
„ *odorata*, 40, 42
„ *pedunculosa*, 44
„ *pycnantha*, 48, 67
„ *Roxburghiana*, 45
„ *simiarum*, 58
„ *sphærocarpa*, 108
„ *stenopetala*, 43, 49
„ *suaveolens*, 37
„ *subcordata*, 65
„ *undulata*, 45
„ *virgata*, 29
„ *Wrayi*, 43, 47
UNONEÆ, 2, 8, 90
*Urellia*, 226

Digitized by Google

*Urophora*, 226, 227
„ *fasciata*, 226
„ *tæniata*, 226
„ *vittithorax*, 226
*Uvaria*, 2, 8, 11, 23, 24, 74, 79
* „ *andamanica*, 13, 21
„ *astrosticta*, 13, 23
„ *aurita*, 15
„ *axillaris*, 42
„ *Burahol*, 6
„ *canangioides*, 57
„ *cordata*, 17
* „ *Curtisii*, 12, 19
„ *dioica*, 124
„ *dulcis*, 12, 14, 15
„ *elegans*, 21, 111
„ *elliptica*, 7
„ *excelsa*, 13, 22
„ *flava*, 18
„ *fracta*, 42
„ *fulgens*, 104
„ *gigantea*, 74
„ *grandiflora*, 14, 17
„ *Hamiltoni*, 12, 13, 14
„ „ *var. Kurzii*, 14
„ *heterocarpa*, 23, 26
„ *hirsuta*, 12, 18
„ *javana*, 15
„ *Larep*, 12, 13
„ *latifolia*, 105, 106
„ „ *var. ovoidea*, 106
„ „ „ *typica*, 106
„ *Lobbiana*, 12, 13, 15
„ *longifolia*, 105
„ *mabiformis*, 112
„ *macrophylla*, 12, 14, 16,
„ *manubriata*, 105
„ *micrantha*, 13, 21, 93
„ *nutans*, 122
„ *obtusa*, 86
„ *odorata*, 41
„ *ophthalmica*, 122
„ *ovalifolia*, 17
„ *oxyantha*, 114
„ *parviflora*, 8, 10
„ *pauci-ovulata*, 12, 20
„ *pilosa*, 18
„ *platypetala*, 17
„ *purpurea*, 12, 14, 17, 18
„ „ *var. tuberculata*, 18
„ *reticulata*, 87
„ *rhodantha*, 17
„ *Ridleyi*, 12, 19
„ *rufa*, 23, 110
„ *rufescens*, 17
* „ *Scortechinii*, 13 20
„ *sub-repanda*, 13, 23, 24
„ *sumatrana*, 21
„ *timoriensis*, 23, 26
„ *tomentosa*, 109
„ *trichomalla*, 18
*Uvaria, tripetala*, 122
„ *velutina*, 18
„ *Vogelii*, 90
„ *zeylanica*, 40
UVARIÆ, 2, 7, 8, 90
*Valonia*, 223
„ *complicata*, 223
*Ventrimacula doryca*, 159
*Vidalia*, 225
„ *impressifrons*, 225
*Volucella*, 163, 174, 188, 190, 196, 201
„ *aurata*, 174
„ *mutata*, 174
„ *nubeculosa*, 174
„ *obesa*, 174
„ *opalina*, 174
„ *peleterii*, 174
„ *trifarciata*, 174
*Voria*, 183
*Winthemia*, 182, 186
*Xarnuta*, 209
„ *leucotelus*, 209
*Xiphandrium*, 157
*Xiria*, 221
„ *antica*, 221
„ *obliqua*, 221
*Xylopia*, 3, 107, 111, 112
„ *caudata*, 113, 117
* „ *Curtisii*, 113, 116
„ *dicarpa*, 113, 114
„ *elliptica*, 113, 117
„ *ferruginea*, 114, 120
„ *fusca*, 113, 116
„ *magna*, 114, 120
„ *Maingayi*, 113, 115
„ *malayana*, 113, 115
„ *obtusifolia*, 114, 119
* „ *olivacea*, 114, 119
„ *oxyantha*, 113, 114
„ *pustulata*, 113, 116
* „ *Ridleyi*, 114, 121
* „ *Scortechinii*, 114, 118
„ *stenopetala*, 114, 118
XYLOPIEÆ, 3
*Xylota*, 173
„ *æqualis*, 173
„ *æthusa*, 173
„ *calopus*, 173
„ *conformis*, 173
„ *cuprina*, 173
„ *indica*, 173
„ *nigroænescens*, 173
*Xyloteja*, 173
XYLOTOMÆ, 153
XYLOTOMES, 153
*Xyphocera*, 138
„ *percheronii*, 188
*Yetodesia*, 203
*Zambesa*, 183
„ *ocypteroides*, 183
*Zelia*, 187

Digitized by Google

*Zenillia*, 186
*Zigemula flavipennis*, 219
*Zona*, 200
„ *violacea*, 200
Zoobiæ, 179, 234
Zoobidi, 234
Zoobidæ 234
*Zoomyia*, 235
*Zygænula*, 219

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